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THE BUFFERING EFFECT OF SIBLING RELATIONSHIPS ON PROBLEMS WITH PEER
EXPERIENCES AND PSYCHOLOGICAL FUNCTIONING IN CHILDREN WITH
COGNITIVE DISABILITIES

by

ANDREA R. HINDES

Under the Direction of Frank J. Floyd, Ph.D.

ABSTRACT

This study examined mechanisms by which sibling relationships may buffer the harmful effects of negative peer experiences on the psychological adjustment of children with mental retardation (MR) or learning disabilities (LD). The study broadened existing findings with typically developing children and examined the effects of sibling social competency training on peer experiences and the impact of sibling relationship qualities, including warmth and positivity, supportiveness, conflict, and negativity, on children's loneliness, internalizing, and delinquent behavior problems. The participants included 100 families with children who were between 8 and 10 years old. The families had a sibling dyad in which the target child had MR ($n = 36$), an LD ($n = 43$), or was typically developing ($n = 21$), while siblings were typically developing. Parents, target children, and siblings completed questionnaires and interviews assessing family and peer relationships. Sibling dyads completed a video-taped interaction. Results indicated that, as predicted, children with an LD or MR experienced significantly lower rates of positive peer experiences and significantly higher rates of negative peer experiences than

did typically developing children. They exhibited significantly higher rates of loneliness and internalizing, but not delinquent, behavior problems than typically developing children. There was only partial support for the hypothesized protective effects of siblings on children's development of adverse peer experiences. In particular, there was an indirect effect of one form of social competency training: social involvement mediated the effect of learning disabilities on adverse peer experiences. As predicted by the buffering hypothesis, emotional supportiveness by siblings moderated the impact of negative peer experiences on children's internalizing and delinquent behavior problems. In addition, negativity within the sibling relationship moderated the effect of negative peer experiences on children's internalizing problems while sibling conflict moderated the effect of positive peer experiences on loneliness. There were no significant effects for sibling warmth and positivity. Findings that siblings of children with MR or an LD can buffer some of the harmful effects of adverse peer experiences on psychological well being in specific instances suggest that including siblings in interventions aimed at improving peer experiences and psychological functioning may be relevant under certain circumstances.

INDEX WORDS: Siblings, Peers, Mental retardation, Learning disabilities

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Georgia State University

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Andrea R. Hinds
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Chapter 1

Introduction

Children with learning disabilities or mental retardation are at high risk for developing problems with peers, such as rejection, neglect, and friendlessness (Diamond, LeFurgy, & Blass, 1993; Guralnick & Groom, 1987b; Heiman & Margalit, 1998; Kupersmidt, Patterson, & Griesler, 1988; Stiliadis & Wiener, 2001; Taylor, Asher, & Williams, 1987; Vaughn, Elbaum, & Schumm, 1996; Voeltz & Brennan, 1984). Furthermore, experiencing problems with peers likely increases their risk for developing problems with loneliness, depression, anxiety, and delinquency (Dekker & Koot, 2003; Dykens, 2000; Parker & Asher, 1987; Prior, Smart, Sanson, & Oberklaid, 1999; Reid, 1980; Reiss & Rojahn, 1993). Thus, it is important to identify protective factors that may buffer these risks. Such protective factors may lie in children's relationships with their siblings. Research has suggested that children's relationships with their brothers and sisters can provide a context in which children can develop, practice, and improve their social interaction skills (Brody 1998; Kitzmann, Cohen, & Lockwood, 2002; Lockwood, Kitzman, & Cohen, 2001). Moreover, research also indicates positive sibling relationships that are high in support and warmth enhance or protect a child's psychological well-being either directly or by buffering the effects of a wide variety of stressors (Bryant, 1992, Conger, Conger, & Elder, 1994), and (Tyndall-Lind, Landreth, & Giordano, 2001). Therefore, the current study examines the potential buffering effect that sibling relationships have on the development of problematic peer experiences and subsequent problems in psychological functioning in children with cognitive disabilities. It tests the hypotheses that siblings can provide training in social

competency as well as warmth and support in the presence of the stress associated with peer problems, and thus, both prevent and help the children to cope with peer problems.

Psychological Functioning in Children with Cognitive Disabilities

For the purposes of the current study, both learning disabilities and mental retardation will be referred to as types of cognitive disabilities. Considerable research indicates that children with learning disabilities and mental retardation are at high risk for psychopathology. With respect to children with learning disabilities, research has suggested that these children are at risk for developing externalizing disorders (i.e. conduct disorder, oppositional defiant disorder) and internalizing disorders (i.e. depression, anxiety, phobia) when compared to non-learning disordered peers (Dyson, 1993; Prior et al., 1999). For example, Prior and her colleagues (1999) found in their longitudinal study of preadolescent children with learning disabilities that over half of their sample met criteria for a DSM-III-R diagnosis. Similarly, children with mental retardation have also been identified as having problems with psychological functioning (Jacobson, 1990). In particular, in her review of the literature on psychopathology among children with mental retardation, Dykens (2000) found that estimates varied from 10 to 70 % of all children with mental retardation exhibit some sort of psychopathology. Rates of depression, for example, among children with mental retardation have ranged from 9 % (Reiss & Rojahn, 1993) to 22 % (Reid, 1980). Rates of anxiety disorders among children with mental retardation have been reported as high as 21.9 % (Dekker & Koot, 2003).

Children's Peer Relationships

Although substantial research illustrates the strong association between cognitive disabilities and problems in psychological functioning, the mechanisms of influence are unclear (Dykens, 2000). One potentially important mechanism concerns problematic peer experiences.

In order to understand the importance of problematic peer experiences as a mechanism in the association between cognitive disabilities and problems in psychological functioning, it is important to first identify the terminology used in the literature on peer experiences.

Peer experiences and friendship. Literature examining children's functioning with peers generally focuses on two domains, peer experiences and friendships. Peer experiences refer to the general treatment of children by their peers. Peer status, a more specific form of peer experiences, refers to the extent to which the child "fits in" with children of the same age and gender. In general, researchers have identified three types of peer status: accepted, rejected, and neglected. Research indicates that these statuses are relatively stable over time for both preschoolers (Rosenblum & Olson, 1997) and older children (Gottman, 1977). Peer acceptance, a positive form of peer status, occurs when others like (Ladd, Kochenderfer, & Coleman, 1997) or want to spend time with a child (Doll, 1996). In contrast, the other two status types are considered negative forms of peer status. Rejection occurs when peers actively dislike children and view them as exhibiting aggressive or abnormal behavior, demeanors, and ways of speaking (Dygon, Conger, & Keane, 1987; Gottman, 1977). Peer neglect occurs when peers fail to pay attention to children (Dygon et al., 1987; Gottman, 1977). Although the causes for neglect are difficult to discern, research indicates that peers perceive these children negatively as breaking school rules, performing inefficiently on tasks, and failing to attend to others (Dygon et al., 1987).

In contrast to peer experiences and peer status, friendship refers to the presence of one or more relationships that are reciprocal, voluntary, and mutual. It is defined as the voluntary (Ladd et al., 1997) and mutual selection between children in which each child simultaneously chooses the other as a friend (Doll, 1996; Lindsey, 2002). It is based on mutual affection, shared

interests, commitment, loyalty, self-disclosure, and shared power (Doll, 1996). Friendship can be independent of peer status such that accepted children may lack reciprocal friendships and children who are rejected or neglected by most peers may have one or more friendships.

Peer experiences among children with cognitive disabilities. Substantial research indicates that children with cognitive disabilities, including both learning disabilities and mental retardation, are at an increased risk for problematic peer experiences. Regarding learning disabilities, in their study of 2nd, 3rd, and 4th graders, Vaughn and colleagues (1996) showed that children who were diagnosed with a learning disability were less liked by their peers than their peers without learning disabilities. Other research also shows that children with learning disabilities are less accepted by their peers (i.e. how much children wanted to spend time with them) than children without learning disabilities (Stiliadis & Wiener, 2001). Substantial evidence indicates that, like children with learning disabilities, children with mental retardation are less popular, more rejected, and more neglected than their typically developing peers (Diamond et al., 1993), and they also are less likely to have reciprocated or close friendships than typically developing children (Heiman & Margalit, 1998; Kupersmidt et al., 1988; Taylor et al., 1987; Voeltz & Brennan, 1984). For example, Diamond et al. (1993) investigated preschooler's preferences for playmates in a fully integrated preschool classroom containing children with mild to severe disabilities and same-age peers without disabilities. The investigators found that children with disabilities received significantly lower ratings of peer acceptance than children without disabilities. Moreover, those preschoolers with disabilities were significantly less likely to be identified as a best friend than were children without disabilities (Diamond et al., 1993). In regard to older children with mental retardation, Sabornie and Kaufman (1987) found that adolescents with mental retardation who attended regular classes

for part of the day were significantly less accepted and more rejected than their classmates without mental retardation. With respect to friendship, children with mental retardation are less likely to have reciprocal friendships, and, when they do, they tend to differ from those of typically developing children (Siperstein, Leffert, & Wenz-Gross, 1997). For example, Siperstein et al. (1997) found that friendships between children with mental retardation and typically developing children were lower in shared play and egalitarian decision-making and had a more hierarchical division of roles than friendships among typically developing children.

Risk Factors Associated with Problems in Social Competency Among Children with Cognitive Disabilities

The mechanism by which cognitive disabilities lead to problematic peer experiences is most likely associated with risk factors that predispose children with cognitive disabilities to problems in social competency. Broadly defined, social competence is considered a multidimensional construct that refers to the combination of the understanding and use of social skills, the absence of inappropriate social behavior (i.e. aggression, delinquency), and the presence of positive relations with others (Haager & Vaughn, 1995). In her review of the literature on social functioning for children in general, Doll (1996) concluded that there are several major risk factors that contribute to problematic peer experiences, all of which undermine social competence. Three of these risk factors include aggressive behavior, deficits in social skills, and limited opportunities for social interaction (Doll, 1996). Because all three of these factors are common problems among children with learning disabilities and mental retardation (Cuskelly & Dadds, 1992; Dekker & Koot, 2003; Gath & Gumley, 1986; Hagar & Vaughn, 1995; McConaughy & Ritter, 1986; Stiliadis & Wiener, 2001; Taylor et al., 1987) it is likely that they provide the mechanisms for the peer problems experienced by these children.

Behavior problems. With respect to behavior problems, Doll (1996) argues that children who exhibit problematic behavior, such as aggression, are at an increased risk for difficulty with peers. In particular, researchers (i.e. Coie & Kupersmidt, 1983; Dodge, 1983; Patterson et al., 1989) have found that aggressive behavior leads to rejection by peers. In fact, aggressive behavior is the most frequently cited reason for disliking by peers (Dodge, 1991). Thus, children who engage in physical and verbal aggression, such as, fighting, bullying, kicking, and arguing, are less likely than non-aggressive children to have friends (Doll, 1996), to be accepted by peers, and to report feeling socially satisfied (Ladd & Burgess, 1999). Moreover these children are more likely to be victimized by their peers and to endorse feelings of loneliness (Ladd & Burgess, 1999).

For children with cognitive disabilities, considerable evidence indicates that children with learning disabilities or mental retardation exhibit significantly more behavior problems than typically developing children. For example, McConaughy and Ritter (1986) found that boys with learning disabilities exhibited significantly higher rates of aggressiveness and delinquency than did children without learning disabilities. Similarly, among children with borderline to moderate intellectual disability, 25 % have been identified as having disruptive behavior disorders (met DSM-IV criteria) (Dekker & Koot, 2003). Of these children, almost 14 % were diagnosed with oppositional defiant disorder and 3 % were diagnosed with conduct disorder (Dekker & Koot, 2003). Moreover, among children with Down syndrome, estimates have been as high as 34 % for behavioral problems as rated by their parents (Gath & Gumley, 1986). Children with Down syndrome have been shown to have higher rates of conduct disorder and aggression than their typically developing siblings, as rated by their teachers and parents (Cuskelly & Dadds, 1992).

Deficits in social skills. Deficits in social skills also predispose children to problems with peer experiences. Although there is no universally accepted definition of social skills (Nanson & Gordon, 1999), broadly speaking, these skills include prosocial behavior (i.e. cooperation, helping others), the ability to perspective take (i.e. the ability to understand another's thoughts, beliefs, and point of view), the ability to interpret social cues (appropriately interpret another's affect and behavior), and the ability to understand social rules that apply to specific situations (i.e. to understand how to act appropriately in different environments), all of which allow individuals to initiate and to continue positive interactions with others and avoid negative interactions (Chadsey-Rusch, 1992; Doll, 1996). For example, children who are categorized as accepted have been shown to engage in significantly more prosocial behaviors (i.e. sharing, helping, complimenting) than rejected or neglected children (Dygdon, Conger, & Keane, 1987). Moreover, Doll (1996) argued that children who are able to perspective take have better peer relationships because they are more likely to engage in prosocial behaviors such as aiding and assisting their peers. Accordingly, research shows that children who are rejected or neglected tend to have problems with accurate perspective taking, are more likely to assume hostile intentions in others, and are more likely to react aggressively to ambiguous or prosocial situations (Dodge, Murphy, & Buchsbaum, 1984). With respect to demonstrating an understanding of social rules that apply to specific situations, researchers have found that children who have difficulty with appropriate behavior in specific situations are more likely to have problematic peer relationships. In particular, in their study of 1st graders, Dygdon, Conger, and Keane (1987) found that children who were neglected were viewed by their peers as breaking school rules and failing to attend when others (i.e. peers or teacher) were speaking. Further, in this same study, children who were rejected engaged in more negative patterns of

speech (i.e. swearing, talking negatively about others) than did accepted children (Dygdon et al., 1987). Similarly, Dodge, Coie, and Brakke (1982) found that 5th graders who were rejected by their peers tended to engage in more inappropriate, off-task behavior during an independent seat-work assignment, which required reprimands by the teacher.

Research has also shown that children with learning disabilities or mental retardation have poorer social skills than typically developing children (Haager & Vaughn, 1995; Vaughn, Hogan, Kouzekanani, & Shapiro, 1990). More specifically, Stiliadis and Wiener (2001) found that children with learning disabilities had significantly more difficulty correctly interpreting social situations presented in pictures than did children without learning disabilities. Moreover, they found that these children were judged by their teachers as more likely than nondisabled children to misinterpret facial expressions, gestures, and other nonverbal cues (Stiliadis & Wiener, 2001). Similarly, investigators have found that children with mental retardation exhibit significantly more deficits in social skills than do children without mental retardation (Greenspan & Granfield, 1992; Siperstein, 1992). In fact, Greenspan and Granfield (1992) and Siperstein (1992) have argued that problems with social competence have long been identified as a prominent feature of mental retardation. For example, Kopp, Baker, and Brown (1992) found that preschoolers with mental retardation tended to engage in less social play (i.e. communicating with someone through talk or gestures) and less positive affect (laughing, smiling) towards others than their typically developing peers. In addition, these children also engaged in more regressive acts, such as repetitive acts, throwing toys, and mouthing toys than typically developing children (Kopp et al., 1992).

Limited opportunities for social interaction. Finally, Doll (1996) theorized that limited opportunities to interact with others are a third factor that is associated with the development of

poor peer experiences. In particular, children require a history of successful social interactions with others in order to encourage them to continue interacting and contributing to relationships with others (Doll, 1996). However, as Doll (1996) asserts, children who have limited time to spend with their peers because of scheduling (i.e. placed in special education classrooms), living situations, or transportation problems may have disrupted or few friendships with others and limited opportunities for practice and mastery. Such limited opportunities for social interaction can exacerbate children's problems with social interactions as these children may become anxious and wary of interacting with others due to lack of practice, and, as a consequence, begin to believe that they lack effective social skills and control within their interactions with others (Doll, 1996).

Limited opportunities for social interaction is an issue that is particularly relevant for children with learning disabilities and mental retardation. Many of these children often receive pull-out instruction during school in which they are removed from their classrooms for large periods of time, which, unfortunately, disrupts their participation within the classroom community (Taylor et al., 1987). In addition, children with learning disabilities or mental retardation have been shown to have fewer contacts with friends and belong to fewer organizations than non-learning disordered and typically developing samples (Diamond et al., 1993; Guralnick, 1997; McConaughy & Ritter, 1986). As a result of fewer social contacts and less classroom membership, children with learning disabilities and mental retardation are further removed from normative social contacts, thereby increasing their risk for problems with social competency, and, as a result, problems with peer experiences.

Problematic Peer Experiences and Psychological Adjustment

The negative consequences of problematic peer experiences for psychological adjustment are well documented by research on children who do not have disabilities, and at least some research addressing children with disabilities as well. This research implicates peer status in the form of rejection and peer neglect, as well as friendlessness, as risk factors for psychological maladjustment, with each of these types of peer problems associated with unique mechanisms of influence on psychological adjustment.

Peer status. With respect to peer status, children who are accepted by their peers tend to exhibit lower levels of anxiety (Hymel, Ruben, Rowden, & LeMare, 1990; Rosenblum & Olson, 1997; Wentzel & McNamara, 1999) and depression (Wentzel & McNamara, 1999) and higher levels of overall well-being and self esteem than do children with problematic peer experiences. With respect to negative forms of peer status, the bulk of the research has focused on the detrimental effects of peer rejection on psychological functioning. Children who are rejected by their peers exhibit higher levels of self- and teacher- reported depression (Bell-Dolan, Foster, & Christopher, 1995; Hymel, Vaillancourt, McDougall, & Renshaw, 2002) and self-reported loneliness (Asher & Wheeler, 1985; Hymel et al., 1990) than do accepted children. These children also tend to report lower rates of perceived self-competence (i.e. cognitive, physical, social, appearance, behavioral conduct, and general self-worth) than accepted children (Hymel et al., 1990). There is evidence to suggest that the harmful effects of peer rejection occur early in childhood and are long-standing. Specifically, as early as preschool children form opinions of their classmates that remain consistent across subsequent years in school, such that children who are rejected early on in school tend to remain rejected throughout school, even if they learn to engage in more acceptable social behavior (Conger, Conger, & Scaremella, 1997). Moreover,

early peer rejection has been linked to high levels of loneliness, delinquency, criminality, and conduct problems in later childhood and adolescence (Hymel et al., 1990; Parker & Asher, 1987). Also, peer rejection in childhood has been linked to high levels of adult adjustment problems such as, depression, paranoid ideation, and psychoticism, and low levels of perceived self-competence (Bagwell, Newcomb, & Bukowski, 1998).

Unlike the literature on peer rejection, the phenomenon of peer neglect in childhood is not as well researched or understood. With respect to negative psychological outcomes, previous research (i.e. Hymel et al., 1990; Parker & Asher, 1987) did not distinguish between rejected and neglected peers and assumed that children who were generally not accepted by their peers would be at a greater risk for psychological adjustment problems (Rosenblum & Olson, 1997).

Although some early literature has suggested that neglected children exhibit more anxious behaviors than do accepted children (Gottman, 1977), some recent research has indicated that neglected children do not exhibit significantly more psychological adjustment problems than do accepted children. In particular, studies indicate that children who are considered neglected do not tend to exhibit more internalizing and externalizing behavior problems (French & Waas, 1985), loneliness (Asher & Wheeler, 1985), or depression and anxiety than do children who are considered accepted (Bell-Dolan et al., 1995), as measured by teacher, parent, or self-report questionnaires. Nevertheless, concerns have been raised that children who are neglected may eventually become rejected due to being socially isolated, and, eventually alienated and rejected by their peers (Rubin, LeMare, & Lollis, 1990). As such, researchers have called for more research regarding the impact of peer neglect on psychological functioning (Rosenblum & Olson, 1997).

Although the literature on neglect and psychological adjustment is limited, peer neglect and subsequent problems with psychological adjustment may be particularly salient for children with cognitive disabilities. In particular, children with mental retardation may be at an increased risk for neglect by their peers because they are less likely to engage in group play and social interactions and tend to engage in more solitary play than typically developing children (Guralnick & Groom, 1987a & 1987b; Kopp et al., 1992). Consequently, children with mental retardation may be more at-risk for peer neglect because they do not interact with their peers as often as typically developing children. Moreover, longitudinal research has suggested that those children who do not interact with their peers are less likely to be accepted by peers and are more likely to develop problems with anxiety (as rated by teachers) and to report lower levels of perceived social competence and self-esteem later on in childhood (Hymel et al., 1990). Being less likely to interact with others, coupled with feelings of anxiety and lower self-esteem, may exacerbate children with cognitive disabilities' problems with peer experiences by further limiting their social skills, which, in turn, may lead to even more anxiety and low self-esteem (Hymel et al., 1990). Further, individuals with mental retardation who have low self-esteem have been shown to be as likely to develop depression as typically developing individuals because they tend to compare their own skills to those of typically developing individuals and believe that they are inadequate (Dagnan & Sandhu, 1999). Research has also suggested that, because children with mental retardation are more likely to be neglected than typically developing peers, they are more likely to report feeling lonely and isolated than children without mental retardation (Luftig, 1988). Taken as a whole, children with mental retardation may be at greater risk for problems in psychological functioning, such as loneliness, depression, anxiety, or delinquency because they are left out.

Friendship. In addition to peer status, the quality of children's friendships has also been identified as an important factor contributing to children's psychological adjustment. In their review of the literature, Bagwell and his colleagues (1998) found that children without friends are at risk for a variety of adjustment problems in general. More specifically, children without friends report lower levels of self-esteem than do children with friends (see Ladd & Kochenberger, 1996). Moreover, research has suggested that the more friends children have, the less likely they are to report loneliness on self-report measures (Asher, Hymel, & Renshaw, 1984). Further, friendships may serve as a protective factor against the negative effects associated with negative peer status on general psychological functioning (Newcomb & Bagwell, 1998). For example, after controlling for acceptance, Mannarino (1978) found that preadolescents who had friends endorsed higher levels of self-concept than did children without friends. Although there is no specific research linking friendlessness to problems with psychological adjustment in children with learning disabilities and mental retardation, it is likely that friendlessness would impact these children's psychological functioning in a way similar to typically developing children.

In summary, considerable research suggests that poor peer experiences mediate the link between cognitive disabilities and problems in psychological functioning. In particular, as noted above, children with disabilities are more likely than typically developing children to exhibit behavior problems (i.e. aggression and delinquency), deficits in social skills, and to have limited opportunities to interact with others, all of which place them at risk for problematic peer experiences. Problematic peer experiences, in turn, have been associated with problems in psychological functioning, such as higher rates of loneliness, depression, anxiety, as well as more problems with delinquency.

Protective Factors: The Influences of Sibling Relationships

The examination of risk factors for adjustment problems raises questions about protective factors that mitigate the impact of risks. Thus, in attempting to understand how problematic peer experiences for children with disabilities may lead to problems with psychological functioning, it is also important to identify protective factors that may reduce the impact of problematic peer experiences on psychological functioning.

One potential buffer in the links between cognitive disabilities, problematic peer experiences, and problems in psychological functioning is sibling relationships. Evidence for the importance of siblings as protective factors for children with cognitive disabilities against problematic peer experiences and problems with psychological functioning is provided by the literature on the importance of siblings for social competency and social support. This literature suggests that, on the one hand, siblings may serve as a protective buffer for the development of problematic peer experiences by providing training in social competency so that children with cognitive disabilities are exposed to models of appropriate behavior, social skills, and have increased opportunities to learn and practice such social skills. In this way, the sibling relationship reduces the risk for developing poor peer experiences or reduces the severity of peer problems for children with cognitive disabilities. Second, when these children do experience problematic peer experiences, siblings can provide social supports to help cope with peer neglect or rejection, and can provide alternative sources of reciprocal friendship. These roles may help to protect against the development of problems in psychological adjustment that might emerge from peer problems for children with cognitive disabilities. Examination of this literature helps to explicate these mechanisms more fully, and thus suggest specific foci for the current investigation.

Siblings and social competency training. There are many reasons to suspect that siblings who do not have disabilities can provide social competency training for their brothers and sisters who have cognitive disabilities. Research with typically developing siblings indicates that siblings tend to be familiar with one another, spend a significant amount of time interacting with each other, and tend to imitate one another's behavior (Dunn, 1989; Dunn, 1992). As such, siblings provide a context in which children can develop, practice, and improve their social interaction skills (Brody 1998; Kitzmann, Cohen, & Lockwood, 2002; Lockwood, Kitzman, & Cohen, 2001), especially with someone who has a similar level of power (Bryant, 1982). Research has suggested that early childhood experiences with siblings that are positive are generally associated with the development of good perspective taking skills (i.e. understanding other's thoughts and feelings) (Dunn, Deater-Deckard, & Pickering, 1999). For example, Howe (1991) and Howe and Ross (1990) found that preschoolers whose interactions with their siblings were more positive (i.e. laughing, smiling, affectionate) or friendly were more likely to engage in perspective taking. Similarly, Dunn and her colleagues (1991) found that preschoolers whose interactions with their siblings were characterized by high levels of cooperation and affection have been shown to have accurate social perceptions (i.e. correctly identifying others' facial expressions and feelings). Similarly, children with warm sibling relationships are popular, liked, unlikely to be perceived as victimized, withdrawn, or rejected, and tend to exhibit high levels of social competence (Lockwood, Gaylord, Kitzman, & Cohen, 2001). Therefore, broadly speaking, substantial evidence suggests that children with positive (i.e. warm, affectionate) relationships with their siblings have better overall social competency.

The impact of conflict in sibling relationships on social competency has also been investigated; however, findings are less consistent and suggest that different degrees of conflict

may have both positive and negative effects on children's competency. It should be noted that conflict is not the polar opposite of warmth in sibling relationships and that it is a unique construct that is discernable from warmth (Brody, 1998; Buhrmester & Furman, 1990). Nevertheless, it has been argued that chronic conflict is generally associated with negative social competence in children (Brody, 1998). Evidence suggests that sibling relationships that are high in conflict promote aggressive behavior in children, problems in social skills (i.e. less helpfulness, less friendliness, and lower perspective taking), and peer rejection (Stormshak, Bellanti, & Bierman, 1996). However, there is evidence to suggest that conflict is not always associated with poor social competence. Howe (1991) found that young sibling dyads were more likely to engage in perspective taking in the form of referring to their siblings internal affective, cognitive, and perceptual state (i.e. "what does your sibling feel, think, see?") when they engaged in either play or conflict with each other. Further, Dunn et al. (1991) found that, in sibling relationships in young childhood, high levels of conflict were not significantly associated with difficulties in affective perspective taking. Moreover, indirect evidence for the assertion that conflict may be beneficial for social skills, such as perspective taking, comes from literature on the links between sibling and peer relationships. Lockwood et al. (2001) found that in 3rd and 4th graders, sibling relationships that were high in conflict were associated with high levels of problematic peer relationships, whereas in 5th and 6th graders, sibling relationships that were high in conflict were associated with low levels of problematic peer relationships. These findings suggest that conflict may be beneficial for social skills in children older than 5th grade. In sum, it has been suggested that specific types of conflict at certain ages may have a beneficial effect on children's development of social skills because of the opportunity that it provides siblings to

express their emotions and feelings, practice open communication, and engage in perspective taking (Brody, 1998; Dunn & McGuire, 1992).

Given the large impact that siblings have on social competency in children in general, it is likely that siblings of children with cognitive disabilities can protect against the effects that cognitive disabilities have on peer experiences. There has been a vast body of research comparing the nature of sibling relationships in which one child has a disability and sibling relationships of typically developing children (Howe, 1993). Research has shown that sibling relationships with and without children with mental retardation are comparable on specific dimensions. In their review of the literature on sibling relationships and mental retardation, Boyce and Barnett (1993) found that most research indicated that within sibling dyads in which one child had mental retardation, the amount of time spent interacting was the same as for sibling dyads in which both siblings were typically developing. In particular, McHale and Gamble (1989) found that sibling dyads with and without a child with mental retardation engaged in approximately 5 activities per day for a total of 2 ½ to 3 hours with their sibling.

One difference between sibling dyads with and without children with mental retardation that has been consistently noted, however, was that among dyads in which one sibling has mental retardation, the typically developing sibling tended to engage in more scaffolding or caregiving behaviors (i.e. teaching, managing, helping) (Boyce & Barnett, 1993; McHale & Gamble, 1989). It appears that siblings of children with developmental delays may tend to direct interactions more than their siblings with developmental delays in order to make the interactions successful (Boyce & Barnett, 1993). Researchers have also shown that sibling interactions with a child with mental retardation typically involve more social and noncompetitive physical activities (i.e. tickling, wrestling) without toys than do interactions among typically developing siblings

(Stoneman, Brody, Davis, & Crapps, 1987). The difference in play behaviors between the two sibling dyads is likely the result of siblings of children with mental retardation compensating for their sibling's limited competence in using play materials (i.e. toys), thereby allowing the children with mental retardation to fully participate in the activity.

Given the significant amount of time that sibling dyads with and without a child with mental retardation spend together as well as the increased amount of scaffolding behaviors provided by siblings of children with mental retardation, it is likely that siblings of children with mental retardation play a significant role in the development of social skills in children with mental retardation. The amount of time spent together and high level of teaching behaviors likely provides ample opportunities for children with mental retardation to engage in social interactions and to practice using social skills. In particular, siblings of children with mental retardation engage in higher levels of prosocial behavior, such as helping and caregiving, and therefore, may serve as models to their siblings of such behaviors. Moreover, interactions between a child and a brother or sister with mental retardation can encourage perspective taking, interpreting social skills, and using appropriate situation-specific behavior because it provides children with mental retardation additional opportunities to practice such skills.

Although there is ample research documenting the nature of sibling relationships in dyads with a child with mental retardation, there has been little research conducted on the nature of sibling relationships in which one sibling has a learning disability. However, because of the risk for problematic peer experiences among children with learning disabilities as a result of their problems with behavior problems, limited social skills, and limited opportunities to interact socially, it is proposed that these sibling relationships will likely be as important in the development of social competency in children with learning disabilities as they are in dyads with

a child who has mental retardation. Specifically, children with learning disabilities can be provided training in social competency by their siblings. Siblings can model appropriate behavior, admonish problem behavior, and provide their brothers or sisters with ample opportunities to learn and practice social skills in a manner similar to that of siblings with brothers or sisters who have mental retardation.

Sibling support and psychological functioning. In addition to providing social competency training, substantial evidence illustrates that positive sibling relationships (i.e. high warmth and support) are associated with fewer psychological adjustment problems in children (Dunn, 2002). Siblings have been shown to provide sources of comfort for children experiencing stressors ranging from parental unavailability (Bryant, 1992), parental hostility (Conger, Conger, & Elder, 1994), domestic violence (Tyndall-Lind, Landreth, & Giordano, 2001), and low socioeconomic status (Conger, Conger, & Elder Jr., 1994). In particular, some theorists have postulated that children may form intense relationships with one another in order to compensate for problems in the family (Bank & Kahn, 1982). For example, it has been postulated that children whose mothers are very depressed or distant may look to their siblings for love and intimacy (Jenkins, 1992). Moreover, in their study of siblings of families with high levels of parental hostility, Conger et al. (1994) found that higher levels of support (i.e. comfort, listening) and warmth (affection) were correlated with lower levels of externalizing problems in children. Similarly, Jenkins (1992) found that 59% of children who had witnessed their parents quarreling actively sought contact with their siblings when the quarrel began. Moreover, she also found that children who were raised in homes with parents with disharmonious marriages were more likely to develop both externalizing and internalizing problems if they did not have a close relationship with their siblings. Further, in general, sibling relationships that are high in warmth

have been associated with lower levels of loneliness in children (Lockwood et al., 2001) whereas sibling relationships that are high in negativity (i.e. high levels of arguments, physical fighting, aggression, or conflict) are linked to high levels of internalizing and externalizing behavior problems (Brody, 1998; Deater-Deckard, Dunn, & Lussier, 2002). In sum, ample research indicates that positive sibling relationships that are high in support and warmth enhance or protect a child's psychological well-being either directly or by buffering the effects of a wide variety of stressors.

Given the large buffering effect that sibling relationships have on the association between a wide range of stressors and children's psychological functioning, it is likely that sibling relationships also buffer the impact of problematic peer experiences on children's psychological functioning. Sibling relationships may be especially important for children with cognitive disabilities, who are at an increased risk for problematic peer experiences. For children with cognitive disabilities who experience negative peer experiences, positive relationships with their brothers or sisters that are high in support (i.e. comfort, listening) and warmth (affection) likely serve as buffers against the stress of problematic peer experiences and protect against the development of loneliness, anxiety, depression, or delinquency. There is substantial evidence illustrating that there exists supportive behavior within sibling dyads in which one sibling has mental retardation. Specifically, in her review of the literature, Stoneman (2001) asserts that most research reveals that relationships of sibling dyads with a child with mental retardation may be equally or more positive (i.e. more warmth, affection, nurturance) than relationships in comparison children. This finding has been robust across various measures, including observations of sibling interactions and parent and sibling report measures (Stoneman, 2001). For example, McHale and Gamble (1989) found that, on observations of sibling interactions,

sibling dyads with and without children with mental retardation did not differ on the number of positive or negative interactions. They also found that on report measures completed by the siblings, the siblings of children with mental retardation reported significantly higher levels of warmth in their interactions with their siblings than did comparison children (McHale & Gamble, 1989). Further, the results of McHale and Gamble's (1989) study indicated that siblings with a brother or sister with mental retardation rated the quality and satisfaction of their sibling relationship as significantly higher than comparison siblings. Taken together, the results of these studies illustrate the presence of high levels of positivity in the form of support and warmth among sibling dyads with a child with mental retardation. Given the high levels of positivity among such relationships, coupled with the evidence that positivity in sibling relationships buffers the effects of significant stressors on children's psychological adjustment, it is likely that these relationships can serve as a buffer for the stress of problematic peer experiences in the psychological adjustment of children with disabilities. Although there is a dearth of research regarding positive behavior in sibling dyads with a child who has a learning disability, it is likely that such sibling relationships buffer the effect of problematic peer experiences on psychological adjustment in a manner similar to that of sibling dyads with a child with mental retardation. That is, among children with learning disabilities, positive sibling relationships buffer the effects of problematic peer experiences by providing alternative sources of warmth and support.

Current Investigation

The present study proposed a multi-step model to understand the association between problematic peer experiences and child adjustment problems within a population of children who are at risk for problematic peer experiences (i.e. children with cognitive disabilities) (see Figure 1). The model predicted that problematic peer experiences would mediate the association

between cognitive disabilities and poor psychological adjustment. Specifically, as noted above, significant research illustrates that children with cognitive disabilities are at risk for problematic peer experiences such as being rejected, neglected, or friendless because of problems with social competency (i.e. problematic behavior, deficits in social skills, and limited social opportunities). Furthermore, considerable research has illustrated that children's peer experiences are critical for psychological well-being and that problems with peers are linked to problems with loneliness, anxiety, depression, and delinquency. Therefore, children with cognitive disabilities likely experience more problems in psychological functioning because they experience more problems with peers.

To better understand the factors that may protect children with cognitive disabilities from problems in peer experiences and problems in psychological functioning, the model addressed the impact that sibling relationships have on two relationships within the mediation. First, siblings can help to improve social competency in their brothers and sisters with learning disabilities or mental retardation by exposing them to models of appropriate behavior, social skills, and increased opportunities to learn and practice such social skills, thereby reducing the risk for problematic peer experiences. Second, siblings can provide their brothers and sisters with cognitive disabilities with alternative sources of warmth and social support to help them cope with problematic peer experiences and, subsequently, protect them from developing problems in psychological adjustment.

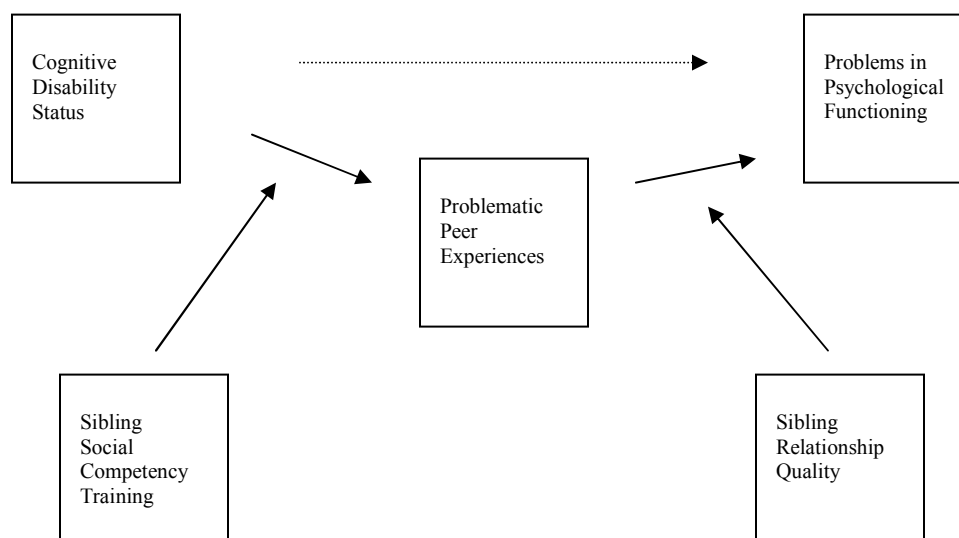


Figure 1 A mediational model that proposes that problematic peer experiences mediate the association between cognitive disabilities and problems in psychological adjustment. Sibling relationships moderate the main effects of a) cognitive disabilities on problematic peer experiences and b) problematic peer experiences and psychological adjustment.

Hypotheses

Drawing from a modified model of the pathway between cognitive disability and child adjustment, the following hypotheses were made:

1. Children who have cognitive disabilities in the form of mental retardation or learning disorders would exhibit significantly higher levels of loneliness, depression, anxiety, and delinquency than typically developing children.
2. A substantial portion of the association between cognitive disabilities and problems in psychological functioning could be accounted for by problematic peer experiences. Specifically, cognitive disabilities would be uniquely related to significantly more problematic peer experiences, which, in turn, would be uniquely related to significantly higher levels of adjustment problems. When this indirect pathway is accounted for the direct association between cognitive disabilities and problems in psychological functioning would be reduced.
3. The quality of sibling relationships would moderate the main effect of cognitive disabilities on problematic peer experiences. Specifically, in sibling relationships with high levels of social competency training (i.e. directives, compliance, facilitation), the main effect of cognitive disabilities on problematic peer experiences (i.e. rejection, neglect, friendlessness) would be non-significant. In contrast, in sibling relationships with low levels of social competency training, the effect of cognitive disabilities on problematic peer experiences would be significant.
4. Sibling relationships would moderate the main effect of problematic peer experiences on problems with psychological functioning. Specifically, within sibling relationships that are high in levels of warmth and support, problematic peer

experiences would not be significantly associated with problems in psychological functioning. In contrast, within sibling relationships with low levels of warmth and support, the effect of problematic peer experiences on problems in psychological functioning would be significant.

Chapter 2

Method

Participants

The participants included 100 families with a child between the ages of 8 and 10 years old who participated in a longitudinal study of families with children who have mental retardation or learning disabilities. In addition, each family included at least one sibling who lived at home. These families were a subset of 141 families that provided data for a larger longitudinal study examining the family and peer experiences of families with children who have mental retardation or learning disabilities. These families were recruited through public schools in several school districts surrounding the Chapel Hill, North Carolina and Atlanta, Georgia area. School officials were sent letters explaining that the project's aim was to understand the family and peer experiences of children with mental retardation or learning disabilities. In order to maintain confidentiality surrounding the enrollment of children within special education classes, it was requested that the school officials distribute these letters to those families who had children with mild or moderate mental retardation enrolled in special education classes or who had been identified with a learning disability. The parents of these children who were interested were then able to contact the project coordinator.

Of these families, 36 had one child with mental retardation (IQ < 70 and significant impairments in adaptive functioning). Children with mental retardation were identified with full assessments at school and were enrolled in special education classes for children with mild or moderate mental retardation. Within this group, 18 families had a child with Down syndrome and others had mental retardation of an unknown etiology. The second group consisted of 43 families with children with learning disabilities. Children were identified as having a diagnosis

of a learning disability through school records (Individual Education Plan reports). In order to meet the criteria for a learning disability, children must exhibit a significant discrepancy between their IQ scores and achievement test scores, with no generalized cognitive delay. In order to clearly distinguish this group from the group of children who had mental retardation, only children who obtained IQ scores above 80 on individually administered intelligence tests were included. Finally, a comparison group of 21 families with typically developing children with no identified disabilities was included. These families were recruited in the same school districts as the children in the other two groups. These children were screened to ensure that they had not been previously or currently enrolled in special education classes for mental retardation and that they did not have a physical disability, a learning disability, or a psychoemotional disorder.

Of the entire sample, 99 mothers and 1 father provided information for the study (please refer to Table 1 for characteristics of parents within the sample). The mothers within the sample were, on average, 39 years old, while the fathers of the two-parent families were almost 41 years old. Mothers and fathers of children with mental retardation tended to be significantly older than mothers and fathers of children with a learning disability. Both mothers and fathers attained an average of 14.7 years of education ($SD = 2.5$), with a range of 12 to 20 years. Mothers and fathers of comparison children attained more years of education than did those parents of children with a learning disability. Families earned approximately \$58,070 per year. The entire sample consisted of 32 single-parent families and 68 two-parent families. Chi-square analyses revealed that there were no significant differences in the number of single- and two-parent homes, $\chi^2(2, N = 100) = .84, p = .66$ based on cognitive disability status of the target children (mental retardation, learning disability, or comparison). Families in each of the 3 groups had approximately 3 children, with no significant group differences $F(2, 97) = 3.56, p = .14$.

Table 1

Background Characteristics of Parents

	Father Age (years)	Mother Age (years)	Father Education (years)	Mother Education (years)	Yearly Income (\$)	Single Parent	Two Parent
Learning Disability	39.0 ^a	36.6 ^a	13.8 ^a	14.1 ^a	51, 564	15	28
Mental Retardation	42.8 ^b	40.4 ^b	15.3 ^{ab}	14.7 ^{ab}	61, 617	11	7
Comparison	41.7 ^{ab}	39.7 ^{ab}	15.5 ^b	15.9 ^b	64, 701	5	16
Total Sample	41.0	38.6	14.7	14.7	58, 070	32	68

Within the sample, there were 68 boys and 32 girls who were identified as target children and 53 boys and 47 girls who were identified as siblings (see Table 2 for characteristics of the children within the sample). Siblings in families with more than 2 children were identified by their parents as the sibling with whom the target child was the closest. Chi-square analyses revealed that there were no significant differences for each cognitive disability group for the gender of the target child, $\chi^2(2, N = 100) = .63, p = .73$, identified siblings $\chi^2(2, N = 100) = 1.49, p = .48$, or the gender of the sibling dyads $\chi^2(4, N = 100) = .73, p = .95$. Of the target children, 52 % were identified by their parents as Caucasian, 44% as African-American, and 4% as “other,” with no significant group differences, $\chi^2(4, N = 100) = 2.12, p = .71$. The target children were roughly 9.6 years old while their identified siblings were 10.6 years old and there were no significant group differences, $F(2, 97) = 1.93, p = .15$ and $F(2, 97) = .95, p = .39$. The mean age difference between the target children and their brothers and sisters was 3.1 years within the entire sample. An ANOVA revealed that there was a significant difference in the age gaps of the sibling dyads among the groups, $F(2, 97) = 3.59, p = .03$. Specifically, sibling dyads with a child with a learning disability tended to have a higher age gap (3.75 years) than those dyads with a sibling with mental retardation (2.56 years). Finally, there were no significant differences between the 3 groups on birth order $\chi^2(2, N = 100) = 3.44, p = .18$. Of the target children, 46 were older than the identified children while 54 were younger.

Table 2

Background Characteristics of Target Children and Their Siblings

	N	Target Children			Identified Sibling			Age Gap (yrs)	
		Age (yrs)	Male	Female	First Born	Age (yrs)	Male	Female	
Learning Disability	43	9.4	31	12	15	11.1	20	23	3.75
Mental Retardation	36	9.8	23	13	9	10.1	20	16	2.56
Comparison	21	9.8	14	7	11	10.3	13	8	2.78
Total Sample	100	9.6	68	32	46	10.6	53	47	3.1

Procedure

The data used in the current study were collected during time 1 of the longitudinal study. Each family participated in two, 2-hour long sessions that were approximately 1 week apart. Assessment teams of two or three interviewers conducted the assessments in each family's home while all of the family members were present. The sessions were generally conducted during the evenings. At the beginning of the first session, families were told that investigators were interested in the behavioral and emotional adjustment as well as family and peer relationships of school age children with and without mental retardation. Family members were also advised that information obtained from each participating family member was strictly confidential and would not be shared with other family members or people outside of the project. Following this explanation, parental consent and child assent were obtained. In order to maintain confidentiality, each family member was interviewed and completed questionnaires in a separate room. Children were usually assessed in their bedrooms. Within the first session, parents completed questionnaires regarding family demographic information, child behavior problems, and other measures of family stress and relationships that are not included in the present investigation. In order to measure the nature of sibling relationships within families with more than two children living at home, one sibling was selected to complete measures and engage in videotaped interactions with the target child. In order to identify this sibling, parents were asked to point out the sibling with whom the target child spent the most time, played the most, and received the most help. The target child was also administered an array of measures assessing the nature of his or her relationship with peers and siblings as well as psychological functioning. During the second session, families participated in a series of videotaped interaction tasks that ranged from 10 to 20 minutes in length. Once family measures were complete, each child's

primary teacher was sent rating forms regarding the child's behavioral, emotional, and social development, which were returned by mail to the project coordinator. Upon completion of the first wave of the study, each family was paid \$75 for their participation.

Measures

Demographics and family composition. A standardized 30-minute interview was conducted with the parents of each family in order to obtain information regarding the age, education, and employment history (if relevant), and ethnicity of each family member. Information regarding the make-up of the household, such as the marital status of the parents of the target child, and the biological, adoptive, or step-relationships among all family members was also obtained.

Peer Experiences. In order to examine children's interactions with their peers as well as the nature of children's friendships, multiple measures were administered to the target child and, typically, the target child's mother and teachers. Research has suggested that multiple reports of peer experiences (i.e. treatment by peers and sociometric status) and nature of friendships are important both because they each offer unique insights into children's social worlds (Ladd, 1983) and because they can yield convergent reports regarding negative child experiences or friendlessness and subsequent psychological adjustment (Cairns, 1983).

Peer Interactions. In order to assess children's own reports of being the recipient of prosocial or aggressive behavior from their peers, each target child was administered a structured interview labeled the *Things That Happen to Me at School*, which is a series of questions modified from Crick and Grotpeter's (1997) *Social Experiences Questionnaire*. The original questionnaire was composed of 26 items that form 3 subscales that examine children's experiences as the recipient of a) prosocial behavior (i.e. "Do other kids try to cheer you up when

you are feeling sad?”), b) overt aggression (i.e. “Do other kids hit, push, kick, or pull your hair?”), and c) relational aggression (i.e. “Do other kids tell lies about you?”). In order to ensure that this measure could be completed by each child in the current study, the length of the measure was reduced to 10 items. Each item was read to the child one at a time. Possible responses to each item were “yes,” “sometimes,” or “no,” and were written on index cards placed before the child to provide a visual aid for the child while making ratings. On the original version, all three subscales have been shown to be sufficiently reliable, with Chronbach’s alphas of .77 or higher (Crick & Grotpeter, 1997). For the current study, the standardized Chronbach alphas suggested somewhat lower reliability for each subscale: .77, .58, and .63 for relational aggression, overt aggression, and prosocial behavior, respectively. Both discriminate validity and construct validity have been shown in studies demonstrating significant associations between children’s experiences of prosocial and aggressive treatment by their peers, peer status, and subsequent psychological outcomes (i.e. depression, social anxiety, and loneliness) (Crick & Grotpeter, 1997).

In addition to the child report measure, a modified version of the *Social Experiences Questionnaire* (Crick & Grotpeter, 1997) was administered to mothers and teachers to examine children’s experiences as recipients of prosocial and aggressive behavior from their peers. The modified questionnaire was composed of 26 statements regarding peers’ behavior toward the target child (i.e. “Some kids try to cheer up this student when he/she is upset.”). On both report forms, responses ranged from 1 = *never true* to 5 = *always true*. For the purposes of the current study, a principal components analysis was conducted on the modified *Social Experiences Questionnaire* parent and teacher report forms in order to reduce the items to broader categories representing overall positive and negative peer experiences. Three components with eigenvalues

> 1.00 emerged for both the teacher and parent report forms, with significant factor loadings for 15 items. Two of these components were considered positive forms of peer relationships: acceptance (7 items) and social support (6 items). The acceptance component consisted of items such as “feels comfortable playing with others,” “is well liked,” and “has warm and accepting friendships.” The social support component was composed of items such as “kids care about this child,” “kids do nice things for this child,” and “kids stand up to others who are mean to child.” In contrast, the third component was considered a negative form of peer relationships: victimization (4 items). Examples of victimization include: “kids yell at this child and call him/her names,” “child is in danger of being hit,” and “kids prevent this child from joining in groups.” All 3 of the components, for both the parent and teacher forms, had adequate internal consistencies, with Chronbach’s alphas of at least .84.

Peer Status. In order to examine children’s sociometric status within their classroom, target children’s teachers were asked to check one out of five statements that best described the child’s sociometric status within their classroom. The statements were generated with regard to common findings in the literature on children’s sociometric ratings of their peers (i.e. popular, accepted, rejected, controversial, neglected) (Coie & Dodge, 1983; Coie, Dodge, & Coppotelli, 1982). The statements included a) is well liked, popular, b) liked about as much as others, c) actively rejected by most kids, d) liked by some, disliked by some, and e) ignored or neglected by kids. The use of scales with such statements have been found to be reliable in differentiating children based on peer status (Coie & Dodge, 1983; Coie, Dodge, & Coppotelli, 1982). Moreover, this type of procedure has been successfully used in previous studies to differentiate children into categories based on status (Ladd, 1983).

Friendship. In order to assess the presence, nature, and quality of friendships, the *Friendship Questionnaire* was completed in interview format by the target child. This interview is a combination of scales developed by Voeltz and Brennan (1984) and Guralnick (1997). Earlier studies of both of these measures (i.e. Guralnick, 1997; Voeltz & Brennan, 1984) have demonstrated good discriminate validity in distinguishing different patterns of social participation among children with mental retardation and construct validity in distinguishing different types of relationships (e.g. “best friend”). The *Friendship Questionnaire* assessed the child’s social contact and his/her participation in general activities with one to three of his/her closest friends (i.e. “How often do you see this friend outside of school?”). In addition, it measured qualitative aspects of the child’s relationship with a best friend and two other friends (i.e. “Who is your best friend?” “How close are you?”).

For the present study, seven indices from the *Friendship Questionnaire* were combined to assess the quality of the children’s experiences with friends. Two of the items assessed positive aspects of friendship: how frequently a specific friend invited the child to participate in activities (0 = *never*, 1 = *sometimes*, 2 = *always*) and the child’s feelings about a specific friendship (0 = *unhappy*, 1 = *sort of happy*, 2 = *happy*). In contrast, five items addressed the negative aspects of the child’s friendship, employing a 3 point scale (0 = *never*, 1 = *sometimes*, 2 = *always*) to assess the frequency that a specific friend a) said mean things behind the child’s back, b) got the child into trouble with adults, c) left the child out of activities, d) told others the child’s secrets, and e) said/did mean things to the child. In order to create a composite score representing the overall quality of a child’s friendship with each friend, the scores for the two positive subscales were added together, while the last 5 subscales were reverse coded and then added to the first two. This procedure was conducted for up to 3 friendships. The Chronbach’s alphas, representing the

internal consistency of the composite score for each of the 3 friendships, ranged from .65 to .75. One score was obtained for each child by selecting the highest value of the three friendship totals. These scores could range from 0 (no friends) to 14 (3 friends whom child saw at the highest frequency and highest quality). Within the current sample, scores ranged from 5 to 13.

Positive and negative peer experiences composites. Two composite scores were formed from the multiple measures of peer experiences, sociometric status, and friendship quality. The first composite reflected children's overall positive relationships with their peers. It was created by calculating the mean of the z-scores from the a) prosocial scale of the *Things That Happen to Me at School*, b) acceptance and social support scales of the *Social Experiences Questionnaire*, c) the score for *Sociometric Status* and d) score for friendship quality from the *Friendship Questionnaire*. The standardized Chronbach's alpha for this composite was .77. A composite reflecting children's overall negative peer experiences was created by calculating the mean of the z-scores from the a) overt and relational aggression scales of the *Things That Happen to Me at School* and b) the victimization scales of the teacher and parent forms of the *Social Experiences Questionnaire*. The standardized Chronbach's alpha for this construct was .66. It is of note that the standardized Chronbach's alpha would have been .71 if the victimization scale from the teacher report form of the *Social Experiences Questionnaire* were removed. However, this scale was preserved because children's relationships with their peers at home and school may differ (East & Rook, 1992) and, as such, researchers (i.e. Dodge et al., 1982; Rosenblum & Olson, 1997) have employed teacher report measures in order to gain a more comprehensive picture of a child's peer experiences. With respect to the current study, the teacher report provided insight into children's relationships with their peers within the classroom environment, which the parent

report could not. Overall, the constructs representing positive and negative peer experiences were weakly correlated, $r(98) = -0.29, p < .01$.

Child adjustment. Children's adjustment was assessed by examining their loneliness, depression, anxiety, and delinquency. Although some have argued that children with cognitive deficits, especially children with mental retardation, are less able to identify and express their internal experience (i.e. anxiety, depression, loneliness), there is evidence to suggest that these children are able to express internal processes including feelings of low self-competence (Dagnan & Sandhu, 1999) and loneliness (Luftig, 1988). As such, measures of children's internal psychological well-being and external behavior were assessed from both mother and child reports.

Loneliness. In order to assess each child's perceptions of loneliness, an abbreviated version of the *Loneliness Scale* (Asher & Wheeler, 1985) was administered. The original scale contains 24 items that assess children's feelings of loneliness, social adequacy, and peer status. It has been shown to have internal consistency coefficient alphas of 0.90 or above (Asher, Parkhurst, Hymel, & Williams, 1990). It has been revised for use with children who have mental retardation and can be administered in interview form to children who have difficulty reading (Williams & Asher, 1992). For this study, the current version used only the 14 critical items related to social rejection (i.e. "Is your school a lonely place for you?", "Do you feel left out of things at school?"). These items were answered in a 3-category response format (i.e. "yes" = 1, "sometimes" = 2, "no" = 3).

For the current study, a composite score for loneliness was determined by calculating the mean of 9 items that assessed factors such as, having friends, feeling understood, cared for, and supported as well as feeling left out, alone, and lonely. The composite demonstrated moderate

reliability, with a Chronbach's alpha of .73. It was positively skewed, as such, the highest data point, which was an extreme outlier, was reassigned to the next highest data point and all scores were log transformed.

Anxiety, depression, and delinquency. Children's anxiety, depression, and delinquency were assessed using the parent forms of the Achenbach Child Behavior Checklist (CBCL) (Achenbach, 1991a, 1991b). The CBCL is a 120-item questionnaire containing a 113 item checklist that can be administered to parents regarding a child's socioemotional and behavioral adjustment. These 113 items are formatted such that the respondent can answer "0" if the problem item is not true of the child, "1" if the item is somewhat or sometimes true, and "2" if the item is very true or often true of the child. Achenbach (1991b) conducted an exhaustive review of the use of the CBCL and reported that it has excellent content and criterion related validity as well as excellent internal consistency. Moreover, Achenbach (1999) reported a coefficient of .88 for the CBCL's test-retest reliability. In the present study, the parent form of the CBCL was completed by the parent who reported being most familiar with the child's behavior in a variety of settings, which, for the current study was almost always the mother. In order to examine a child's depression, anxiety, and delinquency, the T-score of the total scores on the Internalizing and the Delinquency subscales were employed. The Internalizing subscale contains questions such as, "cries a lot," "feels unloved," and "needs to be perfect." The Delinquency subscale includes items such as, "lies or cheats," and "truancy." The T-scores on the Delinquency subscale were log transformed to adjust for the positive skew.

Sibling relationships. Two domains of sibling relationships were measured using a variety of measures across multiple data sources. First, the amount of social competency training in the form of modeling appropriate behavior and providing social opportunities was examined.

Second, the quality of the sibling relationship was assessed by measuring perceived and expressed support, warmth, positivity, conflict, and negativity between the siblings.

Social competency training. The *Sibling Social Involvement Questionnaire*, a 13-item measure, was administered to the identified sibling in interview format to assess training in social competency. The questionnaire was derived from the work of Ladd (Ladd, 1992; Ladd, LeSieur & Profilet, 1993), Rubin (Rubin & Sloman, 1984), and Guralnick (Guralnick, 1997). The interviewer solicited information from the sibling regarding their facilitation of their brother's or sister's involvement in both formal (i.e. "How often have you joined a group or team activity with your brother/sister?") and informal (i.e. "How often have you introduced your brother/sister to your friends?") social activities within the last 6 months. All items contained a 3-category response format (0 = *never*, 1 = *sometimes*, and 2 = *often*). This measure allowed for the examination of the frequency with which siblings provided opportunities for their brothers and sisters with cognitive deficits to interact in social situations. For example, siblings who endorsed frequently inviting their brothers or sisters to join them in playing with a friend were considered to have offered training in social competency, because they provided their siblings with additional opportunities to learn and practice their social skills. The scores of all thirteen items were added together to form an overall construct of sibling social involvement, which had adequate internal consistency, as demonstrated by a Chronbach's alpha of .79.

The *Sibling Interaction Task*, a 10 minute, videotaped interaction task between the target child and his or her sibling that was conducted in the family's home was also used to assess social competency training. Typically, the siblings participated in a task in the kitchen or living room, where no other family members or interviewers were present. A video camera was set up unobtrusively in a corner of the room where it would not interfere with the interaction. The

children were instructed to select from 3 interactive, competitive games (e.g. checkers, Connect Four, Trouble) to play together. This procedure has been used frequently to assess sibling interactions (e.g. Stoneman, Brody, Davis, & Crapps, 1988). Each game was relatively fast paced to ensure that several switches of turn would occur during the 10-minute period. The videotaped interactions were coded and assessed using an event-based coding system developed specifically for this study.

The coding system for the interaction task was derived from a coding system originally created to examine the initiating behavior and responses of brothers and sisters in married and divorced families (MacKinnon, 1989). Evidence for the validity of this coding system comes from research demonstrating that it predicted significant associations between characteristics of the sibling relationships with those of other relationships within the family in expected ways (MacKinnon, 1989). Like many previous studies (i.e. Brody et al., 1982; Brody et al. 1986; MacKinnon, 1989), this coding system assessed children's use of initiating directives (i.e. "You better move your piece here!") and responses to directives (agree, comply, ignore). Other behaviors, which were either positive (i.e. praise, hugging) or negative (i.e. quarrelling, hitting) were also assessed. For this study, the coders were trained until their inter-observer agreement on each individual code reached 85%. Reliability was assessed for 25% of the remaining samples and inter-observer agreement exceeded 85%.

For the current study, the coding was completed using the Observer computer system, which allowed the coder to view the videotaped interactions on the computer and for each behavioral event, record the subject (i.e. target child or sibling), the content of the behavior, and a rating of the affect (i.e. positive, negative) associated with each behavior. A behavior was considered any discernable behavior act. These behaviors typically involved a floor switch,

however, multiple codes may have occurred for one actor between floor switches. The affect accompanying each behavior ranged on a scale from 1 = *unrestrained negative affect* to 5 = *unrestrained positive affect*.

Coding children's use of directives and responses during the videotaped sibling interaction task allowed for the examination of social competency training. Behaviors such as providing directives (i.e. "It's your turn," "Move your piece") as well as responses to directives that expressed agreement or compliance were considered forms of training in social competency. Social competency training was assessed by dividing the frequency of directives provided by the siblings by the frequency of agreement and compliance by the target child.

Relationship quality. In order to assess the quality of the sibling relationship, the *Sibling Relationship Questionnaire* (SRQ) (Furman & Buhrmester, 1985), which refers to the sibling relationship with the target child, was employed. The siblings of the target children were administered the SRQ in interview format. This measure includes 48 forced-choice items that assess 16 dimensions of the sibling relationship, which are grouped into four factors: warmth/closeness, relative status/power, conflict, and rivalry. This scale has been shown to have adequate internal consistency, above 0.70 for all subscales except rivalry, which was .63, as well as high test-retest reliability, ranging from .58 to .86 for all subscales. It also has a low correlation with social desirability. For the purposes of this study, only the warmth/closeness and conflict factors were included. The warmth/closeness factor was composed of 5 subscales: intimacy, prosocial behavior, companionship, similarity, admiration, and affection. In the current study, the warmth/closeness factor had an adequate internal consistency, with a standardized Chronbach's alpha of .84. The conflict factor was composed of 3 subscales:

quarrelling, antagonism, and competition. Similar to the warmth/closeness factor, the conflict factor also had an adequate internal consistency, with a standardized Chronbach's alpha of .77.

The *Sibling Interaction Task* was also employed to examine the quality of the sibling relationship. Positivity within the sibling relationship was evaluated by the frequency of positive behaviors. Positive behaviors were those that demonstrated warmth and support through verbal or nonverbal expressions of praise. Examples of verbal expressions of praise included, “You are doing a good job!” or “You did it!” Nonverbal expressions of praise included giving each other a “high five” or patting one another on the back. In addition, statements made with positive or exuberant affect were considered positive. Negativity within the relationship was assessed by examining such as quarreling, hitting, and destruction of property or verbal expressions with negative affect. Positivity was assessed by the relative frequency of positive behaviors (i.e. praise, exuberant affect). The relative frequencies were calculated by adding the total number of positive behaviors exhibited by the sibling toward his/her brother or sister and dividing by the total number of behaviors exhibited by the sibling toward his/her brother or sister. Similarly, negativity was assessed by the relative frequency of negative behaviors (i.e. quarreling, hitting, competition).

In order to assess the level of support and conflict within the sibling relationship from the target child's perspective, the *My Family and Friends Questionnaire* (Reid & Ramey, 1992) was employed. This questionnaire contains 12 two-part items and is conducted in a Vygotskian-style interview in which the interviewer first assists the child to draw pictures or write names of his/her mother, father, identified sibling, and “best” friend” on separate laminated cards. The interviewer uses these cards to lead the child through the 12 items assessing how likely the each of the four individuals is to provide types of support (emotional, information, instrumental,

companionship) or have conflict with the child. The child is first asked to rank order the individuals from most to least likely. Next, the child is asked to rate the quality, on a 50-point scale, of the support or conflict provided by each person.

With respect to the current study, only the scores from the emotional support and conflict scales pertaining to the identified sibling on the *My Family and Friends* questionnaire were utilized. The emotional support scale was composed of 5 items assessing the level of satisfaction the target child experiences when sharing feelings, sharing accomplishments, seeking validation, and eliciting understanding from the identified sibling. The ratings from each of the 5 items were summed to calculate one measure of overall emotional support. This scale had an adequate internal consistency with a standardized Chronbach's alpha of .86. The conflict scale is based on one item that assessed how angry or upset the child becomes with his/her identified sibling.

Chapter 3

Results

Controlling for Gender Composite and Age Gap of Sibling Dyads

Researchers have suggested that the gender and age of each child within a sibling dyad may affect a child's overall adjustment or peer experiences (Furman & Burhmester, 1985). As such, preliminary analyses were conducted to examine the effects of gender composite and age gap within the sibling dyads on psychological adjustment (loneliness, internalizing, delinquency) and peer experiences.

First, ANOVA's were conducted in order to assess the effects of gender composite on psychological adjustment. Three groups of gender composites were created: a) dyads with two boys, b) dyads with two girls, and c) dyads with one boy and one girl. One-way ANOVA's indicated that there were no significant group differences for loneliness, $F(2, 87) = 1.07, p = .35$, internalizing problems, $F(2, 86) = 1.00, p = .37$, or delinquency, $F(2, 82) = .22, p = .81$. Regarding peer experiences, one-way ANOVAs revealed no significant gender group differences for positive peer experiences, $F(2, 96) = .47, p = .63$. However, there was a significant group difference for overall negative peer experiences, $F(2, 96) = 6.61, p < .01$. Post hoc Duncan tests indicated that, within sibling dyads in which both siblings were boys, the target children had significantly less negative peer experiences than target children in sibling dyads in which there were either two girls or one girl and one boy. Therefore, analyses involving negative peer experiences controlled for this gender composite effect by including a dummy coded vector that contrasted boy-boy dyads (coded 1) with all other dyads (coded 0). With respect to sibling relationships, there were no significant gender group differences for either form of social

competency training: sibling social involvement $F(2, 91) = 1.73, p = .18$ or scaffolding $F(2, 70) = .37, p = .70$. There were no significant gender group differences for positivity $F(2, 70) = .22, p = .81$, warmth $F(2, 85) = .46, p = .64$, conflict $F(2, 70) = 5.06, p = .61$, or negativity $F(2, 70) = 0.91, p = .41$. There was an almost significant difference for emotional support $F(2, 69) = 3.10, p = .051$, sibling dyads with two sisters exhibited higher levels of emotional support ($M = 167.43$) than did sibling dyads with two brothers ($M = 119.72$).

Analyses were also conducted to determine if the age gap between each sibling within the dyad was significantly associated with the outcomes or the mediators. The age gap was calculated as the absolute value of the difference in years between each sibling's age. The correlations between the age gap of the sibling dyad and the variables for psychological adjustment, peer experiences, and sibling relationships were weak and not significant, ranging from $-.004$ to $.20$. However, the correlation between age gap and loneliness approached significance, $r(90) = .20, p = .055$.

Design of Analyses

For the hierarchical regressions, cognitive disability status was dummy coded into 2 vectors that contrasted each of the two disability groups, children with mental retardation (MR) or children with learning disabilities (LD), with the comparison group. In the first vector, children with mental retardation were coded as "1", while children in the LD group and the comparison group were coded as "0". In the second vector, children with a learning disability were coded as "1" and the children in the other groups were coded as "0". These vectors thus first contrasted the group of children with mental retardation with the comparison children and next contrasted the children with a learning disability with the comparison children.

Peer experiences as mediators of the effects of cognitive disability status on psychological adjustment

In order to provide context for the mediation analyses, a correlation matrix listing the relationships between independent variables, mediators, and outcomes is provided in Table 3.

Table 3

Correlation matrix of peer experiences, social competency training, sibling relationship qualities, and adjustment.

	Peer Experiences		Sibling Relationships							
	Positive Peer	Negative Peer	Social Involvement	Scaffolding	Emotional Support	Positivity	Warmth	Negativity	Conflict (MFAF)	Conflict (SRQ)
Positive Peer	1.00	-.29**	0.11	0.04	0.06	-0.16	-0.15	-0.11	-0.05	-0.05
Negative Peer		1.00	0.08	0.21	-0.07	0.01	0.09	0.29*	0.00	0.08
Social Involvement			1.00	-0.01	0.13	0.24*	0.55**	0.02	-0.12	-0.16
Scaffolding				1.00	-0.04	0.09	0.12	-0.02	-0.04	-0.03
Emotional Support					1.00	0.07	0.07	-0.17	-0.29*	-0.02
Positivity						1.00	0.27*	-0.09	-0.38*	-0.23
Warmth/Closeness							1.00	-0.07	-0.15	-0.18
Negativity								1.00	0.11	0.23
Conflict (MFAF)									1.00	0.12
Conflict (SRQ)										1.00
Loneliness										
Internalizing										
Delinquency										

	Adjustment		
	Loneliness	Internalizing	Delinquency
Positive Peer	-.43**	-.42**	-.53**
Negative Peer	.48**	.32**	.52**
Social Involvement	0.16	-0.09	0.01
Scaffolding	0.27*	-0.25	-0.01
Emotional Support	-0.14	-0.08	-0.06
Positivity	0.05	-0.15	-0.05
Warmth/Closeness	0.14	-0.19	0.00
Negativity	0.09	0.21	0.19
Conflict (MFAF)	0.08	0.25	0.03
Conflict (SRQ)	0.01	0.13	0.27
Loneliness	1.00	.22*	.39**
Internalizing		1.00	.56**
Delinquency			1.00

Loneliness. To test the hypothesis that positive peer experiences would mediate the effects of having a cognitive disability on loneliness in children, a series of regressions was conducted to evaluate associations among the predictors, criteria, and mediators, followed by Sobel tests of the predicted indirect effects. In the first regression, the transformed scores for loneliness were regressed onto the two group vectors for cognitive disability status. There was a significant overall effect for this step, $R^2 = .19$, $F(2,87) = 10.45$, $p < .01$, and both of the individual β 's for the MR vector ($\beta = .56$, $p < .01$) and the LD vector ($\beta = .34$, $p < .01$) were significant. Next, the composite for positive peer experiences was entered into the second step of the regression. At this step, the β weight indicated that positive peer experiences contributed significantly to the prediction of loneliness ($\beta = -.34$, $p < .01$). Notably, within this step, the β for the MR vector and the β for the LD vector remained significant, though the β for the MR vector also decreased in value, consistent with mediation (please refer to Table 4). Third, the associations of the putative mediator, positive peer experiences, with the predictors were evaluated by regressing the mediator on the two group vectors. The MR vector significantly predicted less positive peer experiences ($\beta = -.30$, $p = .02$), but learning disability was not a significant predictor ($\beta = -.12$, $p > 0.05$).

Thus, the findings suggested that positive peer experiences partially mediated the effects of MR status, but not LD status on loneliness. Finally, Sobel tests were conducted in order to evaluate whether the indirect effects of positive peer experiences as a mediator were significant. For the indirect effect with mental retardation as the predictor, the Sobel test reached the $p = .051$ level of significance ($z = 1.95$), however, it was not significant for learning disabilities ($z = .89$, $p > .05$).

The same procedure was employed to test whether negative peer experiences also mediated the effects of disability status on loneliness. After the loneliness score was regressed on cognitive disability status (as noted above), the composite of negative peer experiences was entered into the second step of the regression. At this step, negative peer experiences significantly contributed to the prediction of loneliness in children ($\beta = .37, p < .01$). Within this step, the β 's for both mental retardation and learning disability decreased and mental retardation remained a significant predictor of loneliness but learning disability did not (refer to Table 4). Third, the associations of the putative mediator, negative peer experiences, with the predictors were evaluated by regressing the mediator on the two group vectors. Both the MR vector ($\beta = .48, p < .01$) and the LD vector ($\beta = .41, p < .01$) significantly predicted more negative peer experiences. Thus, the findings were consistent with the notion that negative peer experiences mediated the effects of LD status on loneliness and partially mediated the effects of MR status on loneliness.

Finally, Sobel tests were conducted in order to evaluate whether the indirect effects of negative peer experiences as a mediator were significant. For the indirect effect with learning disabilities as the predictor, the Sobel test was significant ($z = 2.52, p = .01$). It was also significant with mental retardation as the predictor ($z = 2.71, p < .01$). Therefore, the findings provide support for the prediction of an indirect effect of both types of cognitive disability status on loneliness through negative peer experiences. Negative peer experiences fully mediated the effect of a learning disability on loneliness. The direct effect of mental retardation on loneliness remained significant, suggesting that there was a partial, rather than full, mediation on loneliness.

Table 4

The regression coefficients and ΔR^2 for each mediation at both steps of the hierarchical regression.

	Loneliness				Internalizing				Delinquency			
	b	SE of b	β	ΔR^2	b	SE of b	β	ΔR^2	b	SE of b	β	ΔR^2
Positive Peer Relationships												
<i>Step 1</i>												
MR vs. Comparison	0.30**	0.07	0.56**		6.99*	3.30	0.27*		0.04	0.03	0.15	
LD vs. Comparison	0.17**	0.06	0.34**		10.33**	3.19	0.41**		0.05	0.03	0.22	
				0.19				0.10				0.03
<i>Step 2</i>												
MR vs. Comparison	0.23**	0.06	0.44**		7.99*	3.38	0.31*		-0.01	0.03	-0.04	
LD vs. Comparison	0.15**	0.06	0.30**		10.69**	3.20	0.43**		0.03	0.03	0.11	
Positive Peer	-0.13**	0.04	-0.34**		2.50	1.95	0.13		-0.10*	0.02	-0.54*	
				0.10				0.02				0.27
Negative Peer Relationships												
<i>Step 1</i>												
MR vs. Comparison	0.30**	0.07	0.56**		6.99*	3.30	0.27*		0.04	0.03	0.15	
LD vs. Comparison	0.17**	0.06	0.34**		10.33**	3.19	0.41**		0.05	0.03	0.22	
				0.19				0.01				0.03
<i>Step 2</i>												
MR vs. Comparison	0.21**	0.07	0.39**		7.80*	3.55	0.30*		-0.02	0.03	-0.09	
LD vs. Comparison	0.09	0.06	0.19		11.00**	3.38	0.44**		0.00	0.03	0.02	
Negative Peer	0.13**	0.03	0.37**		-1.14	1.83	-0.07		0.09*	0.02	0.54*	
				0.12**				0.001				0.25

* $p \leq .05$, ** $p \leq .01$.

Internalizing. The hypothesis that positive peer experiences would mediate the effects of having a cognitive disability on internalizing problems in children was examined using the same series of regressions and Sobel tests of predicted indirect effects as noted above. In the first regression, the T-scores for internalizing problems were regressed on each of the group vectors for cognitive disability status. The regression equation, $R^2 = .10$, $F(2, 95) = 5.24$, $p < .01$, was significant and indicated that cognitive disability status significantly predicted more internalizing problems in children. Both mental retardation ($\beta = .27$, $p < .05$) and learning disability ($\beta = .41$, $p < .01$) were significant predictors of more internalizing problems in children. Next, the scores for positive peer experiences were entered into the regression at the second step and did not significantly predict internalizing problems ($\beta = .13$, $p > .05$). Because there was not a significant direct effect between the putative mediator, positive peer experiences, and internalizing problems, there was no support for mediation by this variable, and no further analyses were conducted. As such, the findings do not support the hypothesized indirect effect through positive peer experiences on the association between cognitive disability status and internalizing behavior problems.

The same procedure was employed to test the hypothesis that negative peer experiences would mediate the effects of having a cognitive disability on internalizing problems in children. After scores for internalizing problems were regressed on cognitive disability status (as noted above), the composite of negative peer experiences was entered into the second step of the regression. At this step, negative peer experiences were not a significant predictor of internalizing problems in children ($\beta = -.07$, $p > .05$), and, as such, do not support the hypothesized mediation by negative experiences of the association between cognitive disability status and internalizing behavior problems.

Delinquency. The same analyses tested the mediator effects of positive and negative peer experiences on delinquency. In the first regression, the transformed T-scores for delinquency were regressed on both of the group vectors for cognitive disability status. In contrast to predictions, there were no significant direct effects of the cognitive disability status variables on delinquency, $R^2 = .03$, $F(2, 82) = 1.23$, $p > .05$, and neither of the effects for mental retardation ($\beta = .15$, $p = .30$) or learning disability ($\beta = .22$, $p = .12$) was significant. Because there was not a direct effect of cognitive disability status on delinquent behavior, the proposed mediation of peer experiences on the association between cognitive disability status and delinquency was not supported, and no further analyses were conducted.

Sibling Social Competency Training Moderates the Effect of Cognitive Disability Status on Peer Experiences

In order to test the hypothesis that social competency training by siblings would moderate the effects of having a cognitive disability on children's positive and negative peer experiences, hierarchical multiple regressions were conducted to test the significance of interactions between disability status and sibling competency training in predicting peer experiences. For positive peer experiences as the outcome, in the first step of the regression, the vector representing mental retardation and the vector representing learning disability were entered as predictors. Next, the centered scores for both measures of social competency training (*Sibling Social Involvement Questionnaire* and *Sibling Interaction Task* scaffolding subscale) were entered. Finally, the four cross products that assessed the interactions between each of the disability vectors and each of the competency training variables were tested to evaluate whether they added significantly to the prediction of peer experiences after accounting for the main effects. The results indicated that the interaction term between learning disability and sibling social involvement did contribute

significantly to the prediction of positive peer experiences ($\beta = -.41, p < .05$). In order to evaluate the nature of the interaction, the regressions lines for the learning disability vector were plotted under the condition of high (+1 standard deviation), medium (at the mean), and low (-1 standard) levels of sibling social involvement. As shown in Figure 2, at low levels of sibling social involvement, there was a relatively negative effect of having a learning disability on positive peer experiences, such that children with learning disabilities had fewer positive peer experiences than did comparison children. At medium levels of sibling social involvement, children with learning disabilities also had fewer positive peer experiences, however, the effect was not as strong as at low levels of sibling social involvement. In contrast, if siblings facilitated high levels of social involvement, there was a relatively positive effect of having a learning disability on positive peer experiences. Thus, these findings support the hypothesis that sibling social competency training moderates the effect of having a cognitive disability on positive peer experiences. However, this finding was only true for one form of sibling competency training, sibling social involvement. In contrast, the effect of scaffolding behavior, a second form of competency training, did not significantly moderate the effect of having a cognitive disability on children's positive peer experiences, and thus did not support hypotheses.

For predicting negative peer experiences, none of the four interaction terms between cognitive disability status and sibling competency training was significant. Thus, these findings did not support the hypothesis that social competency training moderates the effects of cognitive disability on negative peer experiences.

Table 5

Standardized regression coefficients for the moderation of social competency training on the relationship between cognitive disability and problematic peer experiences.

	Positive Peer Experiences	Negative Peer Experiences
	β	β
<i>Step 1</i>		
MR Vector	-0.33	0.41*
LD Vector	-0.19	0.52**
Social Involvement	-0.02	0.10
Scaffolding	0.11	0.08
<i>Step 2</i>		
MR X Social Involvement	-0.19	-0.03
LD X Social Involvement	-0.41*	0.04
MR X Scaffolding	-0.21	-0.05
LD X Scaffolding	-0.17	-0.03

Note. β 's at step 1 represent the regression coefficients of the main effects entered in the first step of the regression. β 's at step 2 represent the value that the regression coefficient of the interaction term would be if entered alone in the next step of the regression.

* $p \leq .05$, ** $p \leq .01$.

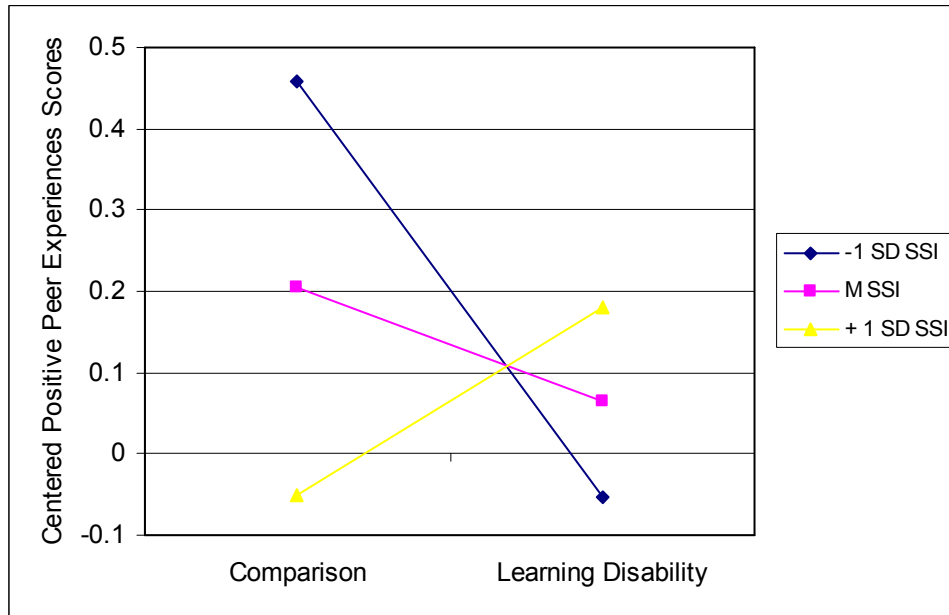


Figure 2

Regression of centered positive peer experiences on the presence of a learning disability at different levels of sibling social involvement.

Sibling Relationship Quality Moderates the Effects of Problematic Peer experiences on Problems in Psychological Adjustment

In order to test the hypothesis that sibling relationship quality would moderate the effect of peer experiences on children's adjustment, hierarchical multiple regressions were conducted to test the significance of interactions between peer experiences and sibling relationship quality in predicting children's loneliness, internalizing behavior problems, and delinquent behavior problems. In the first step of the regression, the two centered scores for the composite of positive as well as negative peer experiences were entered. Next, the centered scores for the six moderators (*MFAF* emotional support and conflict subscales; *Sibling Interaction Task* positivity and negativity subscales; *Sibling Relationship Quality* warmth and conflict subscales) were entered. Finally, the 12 cross products that assessed the interactions between both types of peer experiences and the six types of sibling relationship quality were tested to evaluate whether they added significantly to the prediction of adjustment after accounting for the main effects. The same procedure was employed for each outcome measure: loneliness, internalizing behavior problems, and delinquent behavior problems.

With respect to loneliness, only one of the six types of sibling relationship quality moderated the effect of peer experiences on loneliness and only in the case of positive peer experiences (refer to Table 6 for partial regression coefficients of interaction terms). Analyses revealed that the interaction term of the *MFAF* conflict scores with positive peer experiences contributed significantly to the prediction of loneliness ($\beta = -.22, p < .05$). In order to evaluate the nature of the interaction, the regression lines for loneliness on positive peer experiences were plotted under the condition of high (+1 standard deviation), medium (at the mean), and low (-1 standard) levels of sibling conflict. As shown in Figure 3, as predicted, there was an overall

effect of positive peer experiences and loneliness such that higher levels of positive peer experiences were associated with lower levels of children's reports of loneliness for children at all levels of sibling conflict. However, as expected, the association was strongest for children with high levels of sibling conflict, less strong for children with medium levels of conflict, and weakest for children with low levels of conflict. Thus, the pattern of findings is consistent with the hypothesis that conflict within the sibling relationship would moderate the main effect of positive peer experiences on loneliness in children, such that the effects of peer experiences on loneliness were strongest when there were high levels of sibling conflict. In contrast to hypotheses, emotional support, warmth, positivity, and negativity did not significantly moderate the effect of positive peer experiences on loneliness. Furthermore, none of the forms of sibling relationship quality moderated the effect of negative peer experiences on loneliness.

Table 6

Standardized regression coefficients for sibling relationship quality as a moderator of the effect of positive peer experiences on psychological adjustment.

	Loneliness	Internalizing	Delinquency
	β	β	β
<i>Step 1</i>			
Positive Peer Experiences	-0.37*	-0.36*	-0.41**
Emotional Support	-0.18	0.01	0.00
Positivity	-0.08	-0.20	-0.10
Conflict	0.00	0.09	0.03
Negativity	-0.08	0.06	0.03
Warmth	0.19	-0.12	0.04
Conflict	-0.05	-0.18	0.05
<i>Step 2</i>			
Positive Peer X Emotional Support	0.04	0.23	-0.22
Positive Peer X Positivity	-0.08	0.20	0.14
Positive Peer X Conflict	-0.22*	0.04	-0.07
Positive Peer X Negativity	-0.04	-0.05	0.24
Positive Peer X Warmth	0.16	-0.06	0.11
Positive Peer X Conflict	-0.13	-0.08	0.16

Note. β 's at step 1 represent the regression coefficients of the main effects entered in the first step of the regression. β 's at step 2 represent the value that the regression coefficient of the interaction term would be if entered alone in the next step of the regression.

* $p \leq .05$, ** $p \leq .01$.

Table 7

Standardized regression coefficients for the moderation of sibling relationship quality on the association between negative peer experiences and psychological adjustment.

	Loneliness	Internalizing	Delinquency
	β	β	β
<i>Step 1</i>			
Negative Peer Experiences	0.33*	0.33*	0.44**
Emotional Support	-0.18	0.01	0.00
Positivity	-0.08	-0.20	-0.10
Conflict	0.00	0.09	0.03
Negativity	-0.08	0.06	0.03
Warmth	0.19	-0.12	0.04
Conflict	-0.05	-0.18	0.05
<i>Step 2</i>			
Negative Peer X Emotional Support	-0.14	-0.41**	-0.40 [†]
Negative Peer X Positivity	0.05	-0.07	-0.02
Negative Peer X Conflict	0.12	0.14	-0.23
Negative Peer X Negativity	-0.09	0.30*	0.19
Negative Peer X Warmth	-0.09	0.07	-0.04
Negative Peer X Conflict	-0.07	0.10	-0.04

Note. β 's at step 1 represent the regression coefficients of the main effects entered in the first step of the regression. β 's at step 2 represent the value that the regression coefficient of the interaction term would be if entered alone in the next step of the regression.

[†] $p \leq .06$, * $p \leq .05$, ** $p \leq .01$.

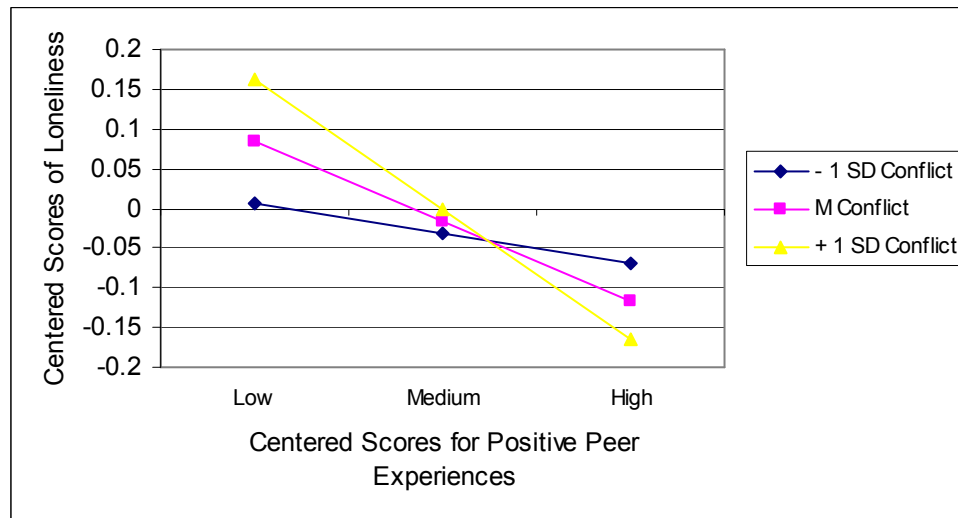


Figure 3

Regression of centered loneliness scores on the centered scores for positive peer experiences at different levels of conflict.

With respect to internalizing behavior problems, as shown in Table 6, two of the six types of sibling relationship quality moderated the effect of peer experiences on internalizing problems but only for negative peer experiences. The results revealed that there was a significant two-way interaction for negative peer experiences and emotional support, as reported by the child ($\beta = -.23, p < .05$). In order to evaluate the nature of the interaction, the regressions lines for negative peer experiences on internalizing problems were plotted under the condition of high (+1 standard deviation), medium (at the mean), and low (-1 standard) levels of emotional support. As shown in Figure 4, at low levels of emotional support, the effect of negative peer experiences was strongest: children with relatively more negative peer experiences exhibited relatively more internalizing behavior problems. For children with moderate levels of emotional support, there was still a positive relationship between negative peer experiences and internalizing problems, but it was weaker. Finally, at high levels of emotional support, children who had relatively high levels of negative peer experiences only exhibited slightly more internalizing behavior problems than those children who had relatively low levels of negative peer experiences. Therefore, consistent with predictions, sibling emotional support buffered the effect of negative peer experiences on internalizing behavior problems in children.

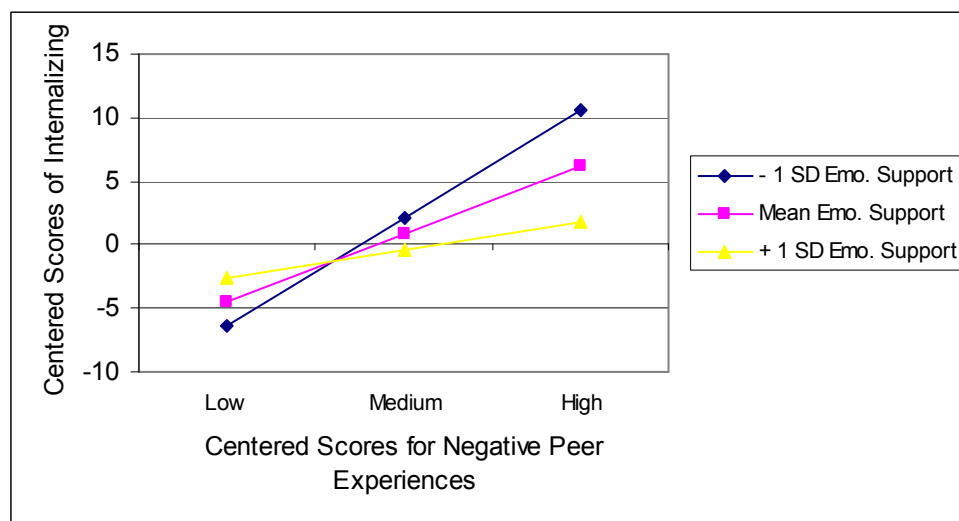


Figure 4

Regression of centered internalizing t-scores on the centered scores for negative peer experiences at different levels of emotional support.

Another hierarchical multiple regression tested the effects of sibling negativity during the interaction task as the moderator in the association between negative peer experiences and internalizing problems. The results revealed that there was a significant two-way interaction for negative peer experiences and sibling negativity on children's internalizing behavior problems ($\beta = .24, p < .05$). As illustrated in Figure 5, the positive slopes of each regression line reflect that higher levels of negative peer experiences were associated with higher scores for internalizing behavior problems. This effect, however, was strongest for those children in which high rates of negativity (+1 standard deviation) were expressed within the sibling relationship. At average levels of negativity within the sibling relationship, children with relatively higher levels of negative peer experiences also exhibited relatively higher levels of internalizing behavior problems, but the effect was weaker. For those children with relatively low levels of expressed negativity (-1 standard deviation) between siblings, the effect was the weakest: children with relatively higher levels of negative peer experiences only exhibited slightly higher internalizing behavior problems than did children with relatively low negative peer experiences. Therefore, these findings support the hypothesis that sibling relationships buffer the effect of negative peer experiences on internalizing behavior problems in children.

However, it is important to note that, in contrast to hypotheses, warmth, positivity, and conflict did not significantly moderate the effect of negative peer experiences on loneliness. Further, none of the six forms of sibling relationship quality significantly moderated the effect of having few positive peer experiences on children's internalizing problems.

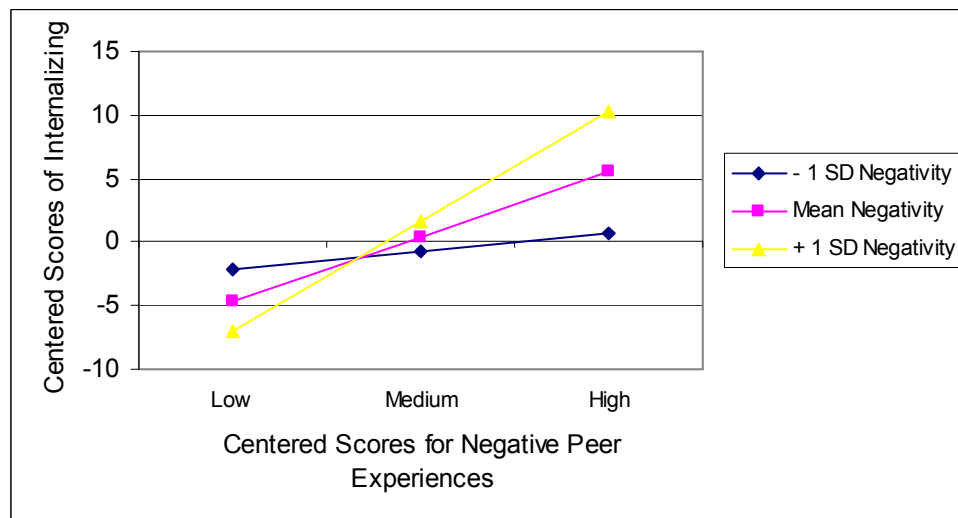


Figure 5

Regression of centered internalizing t-scores on the centered scores for negative peer experiences at different levels of negativity.

Finally, none of the six forms of sibling relationship quality the effect of positive or negative peer experiences on delinquent behavior problems in children (Table 6). However, there was a nearly significant trend for a two-way interaction of negative peer experiences and emotional support on delinquency ($\beta = -.18, p = .06$). In particular, as depicted in Figure 6, the association between relatively high levels of negative peer experiences and relatively high levels of delinquent behavior was, as predicted, strongest for those children who had lower levels (-1 standard deviation) of emotional support from their siblings. At mean levels of sibling emotional support, this association was weaker. Finally, at high levels of sibling emotional support, this relationship was the weakest. Thus, the trend is consistent with the prediction that siblings who provide high levels of emotional support to their brothers and sisters can cushion the effects of having negative peer experiences on delinquent behavior problems.

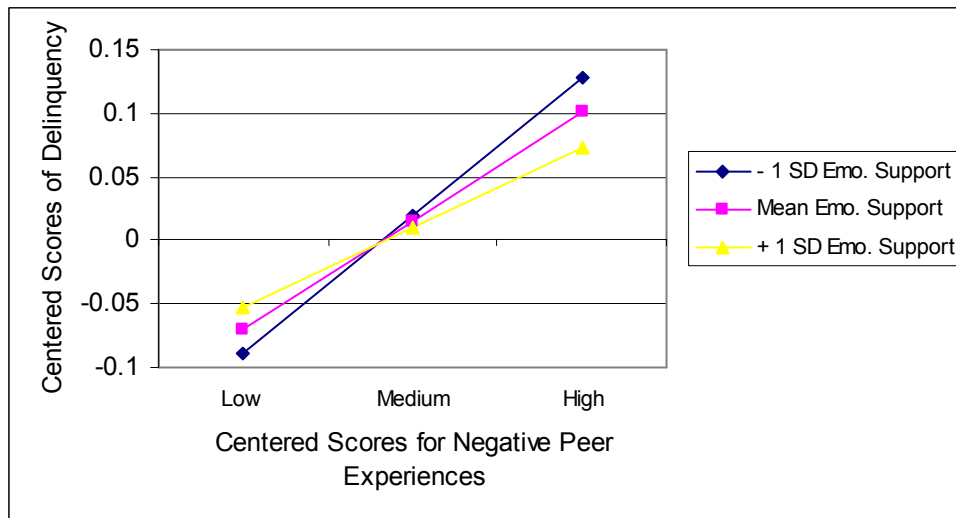


Figure 6

Regression of centered delinquency t-scores on the centered scores for negative peer experiences at different levels of negativity within the sibling relationship.

Chapter 4

Discussion

This study examined the buffering effect that sibling relationships have on the development of problematic peer experiences and subsequent problems in psychological functioning in children with mental retardation and learning disabilities. The results provided partial support for the expected associations between cognitive disability status, peer experiences, and psychological adjustment. There also was support, though limited, for the proposed role of siblings in buffering the effect of developmental disability on peer experiences and subsequent problems in psychological adjustment.

The first hypothesis stated that children with mental retardation or a learning disability would exhibit significantly higher levels of adjustment problems than would typically developing children. There was partial support for this prediction. Specifically, commensurate with the hypotheses and with previous research (i.e. Dykens, 2000; Dyson, 1993; Jacobson, 1990; Prior et al., 1999) children with mental retardation and learning disabilities exhibited significantly higher levels of loneliness and internalizing behavior problems than did children in the comparison group. However, in contrast to predictions and previous research (Dekker & Koot, 2003; McConaughy & Ritter, 1986), this study did not find that children with cognitive disabilities exhibited significantly higher levels of delinquent behavior problems than did comparison children. This failure to confirm the hypothesis may reflect a limitation in the type of measure used to assess externalizing behavior problems. In particular, research has generally noted that children with cognitive disabilities tend to exhibit high levels of externalizing behavior problems, which include high rates of aggressive, disruptive, and delinquent behaviors

(Dekker & Koot, 2003; McConaughy & Ritter, 1986). However, in the current study only delinquent behavior problems were assessed as outcomes of peer experiences because aggression was considered to be a cause rather than an outcome of difficulties with peers. The difficulty with focusing on delinquency is that delinquent behaviors such as, running away, truancy, or stealing are very infrequent for children within the age range of the current study (Achenbach, 1991a). Thus, future research should aim to employ more age-appropriate measures of behavior problems. The *Behavior Assessment System for Children – 2nd Edition* (BASC-2), for example, is a measure with scales that differentiate aggressive and disruptive behaviors (Reynolds & Kamphaus, 2002). The disruptive behaviors are more age-appropriate (i.e. disobeys, lies, breaks rules, and gets into trouble) and not necessarily delinquent. It is also important to note that although research suggests that children with learning disabilities are at an increased risk for delinquency, children with mental retardation, especially within the study's age range, may not be because of their involvement in highly structured environments. In particular, research has shown that parents of children with mental retardation tend to engage in more directives and behavior management than parents of children without mental retardation (Floyd, Costigan, & Phillippe, 1997). It is possible that the parents of children with mental retardation within this sample controlled and structured the situations in which these children were involved and subsequently constricted the opportunity for their children to misbehave.

The findings also provided partial support for the second hypothesis, which proposed that problematic peer experiences would mediate the association between cognitive disabilities and problems in psychological functioning. In particular, it was predicted that children with mental retardation and learning disabilities would experience fewer positive and more negative peer experiences than comparison children, which, in turn would make them more vulnerable to

higher levels of loneliness, anxiety and depression, and delinquent behavior problems. With respect to loneliness, negative peer experiences fully mediated the effect of a learning disability on loneliness, whereas they partially mediated the effect of mental retardation on loneliness. Further, positive peer experiences, to a limited degree, mediated the association between cognitive disability status and loneliness. This mediation, however, was partial and only occurred in children with mental retardation.

The findings of a partial mediation of mental retardation on loneliness through its effects on adverse peer experiences suggests that this more severe form of cognitive disability has influences on loneliness that cannot be fully accounted for by the types of experiences with peers that were examined within the current study. As such, other factors merit further consideration. Research has shown that children with mental retardation have limited opportunities to interact with others (Doll, 1996). Perhaps these limited opportunities, rather than predisposing children to problems with social skills and subsequent problems with peer experiences, have a direct effect on loneliness by simply limiting the amount of time for these children to interact with others socially, thereby making them lonelier. Moreover, in their review of the literature, Nanson and Gordon (1999) noted that individuals with mental retardation may exhibit more problems with psychopathology because they have more difficulty coping with stress. Perhaps children with mental retardation are at a greater risk for loneliness because they have more difficulty coping with the stress of adverse peer experiences. In the future, it will be important to determine whether or not limited opportunities for social interaction as well as deficits in coping skills place children with mental retardation at an increased risk for loneliness.

In contrast to predictions, peer experiences did not mediate the association between cognitive disability status and internalizing behavior problems in children. As predicted,

children with mental retardation and learning disabilities exhibited higher levels of internalizing problems than did typically developing children, which is a common finding in the literature (Dekker & Koot, 2003; Dyson, 1993; Prior et al., 1999; Reid, 1980; Reiss & Rojahn, 1993). However, in contrast to predictions, there was not a significant direct effect between either form of adverse peer experiences and internalizing behavior problems in children. A potential, although limited explanation for this finding, may reflect that, for children with mental retardation, symptoms of anxiety and depression are not as evident to outside observers. In particular, it has been proposed that because of limitations in verbal expression, children with mental retardation are less likely to exhibit anxiety or depression in ways similar to that of typically developing children (Nanson & Gordon, 1999). As such, parents of children with mental retardation within this study may have been less aware of their child's anxiety and depression because these children were less able to verbalize troubling inner experiences. Future research that employs self-report measures of anxiety and depression, such as the *Revised Children's Manifest Anxiety Scale* (Reynolds & Richmond, 1985) and the *Children's Depression Inventory* (Kovacs, 1985), may promote a better understanding of the impact that mental retardation and problematic peer experiences have on internalizing problems among children. However, it is important to note that this explanation is not entirely satisfactory given the occurrence of expected group differences in internalizing problems. Such occurrence may suggest that parent reports were sensitive enough to detect group differences based on cognitive disability status, but not sensitive enough to detect individual differences within groups.

In focusing on the mechanisms by which brothers and sisters protect against the harmful effects of cognitive disabilities on peer experiences and subsequent problems in psychological functioning, the study found some support for the hypothesis that sibling social competency

training in the form of social involvement or scaffolding behavior during play would moderate the adverse effects of having a cognitive disability on children's positive and negative peer experiences. In particular, the results indicated that for those children with a learning disability, social involvement by their sibling reduced the impact of having a learning disability on limiting positive peer experiences. In other words, children with a learning disability whose brothers and sisters involved them in relatively high levels of social interactions were more accepted and supported by their peers. Overall, this finding is consistent with the notion that siblings can provide a context in which children can develop, practice, and improve their social interaction skills (Brody 1998; Kitzmann, Cohen, & Lockwood, 2002; Lockwood, Kitzman, & Cohen, 2001) and supports the hypothesis that this effect occurs even for sibling relationships in which one child has a learning disability.

Interestingly, with respect to the children within the comparison group, the effects of sibling social involvement on positive peer experiences had a larger and opposite effect. Among these children, relatively low levels of social involvement by brothers and sisters were associated with relatively higher levels of positive peer experiences. This finding may reflect that, among typically developing children, high levels of sibling social involvement undermine children's positive experiences with their peers. Perhaps typically developing children who spend a lot of time with their brothers and sisters are not motivated to solicit as many interactions or friendships with other children because their sibling serves as their primary peer. As such, intense sibling bonds may result in the detriment of other important social relationships (i.e. Bank and Kahn, 1997; East & Rook, 1992).

In contrast to predictions, neither social involvement nor scaffolding behavior buffered the effect of having mental retardation on positive peer experiences. Children with mental

retardation were less accepted and supported by their peers regardless of how much their brothers and sisters involved them in social interactions or directed socially appropriate behavior. Further, neither form of social competency training protected children with mental retardation or a learning disability from low acceptance or being hit, teased, or picked on. Perhaps this finding illustrates the importance of reciprocity within social interactions for those children with deficits in social skills, something in which siblings, but not peers engage. Specifically, siblings of children with mental retardation have been shown to engage in behaviors that promote smooth interactions with their brothers and sisters. They provide more directives and engage in activities that are noncompetitive and developmentally sensitive to their brothers' and sisters' cognitive abilities (Boyce & Barnett, 1993; McHale & Gamble, 1989; Stoneman et al., 1987), all of which lead to more successful sibling interactions. Peers of children with mental retardation and learning disabilities, however, may not be so supportive. Classmates of children with mental retardation or learning disabilities, for example, may be more likely to become irritated by these children because of their problems with off-task, disruptive, impulsive, and hyperactive behavior, which are exacerbated within classroom environments (Dodge et al., 1982). Thus, the current study's findings may reflect that children with cognitive disabilities require in-the-moment structure, support, and patience from others for successful interactions to the extent that any socially competent behavior acquired from their siblings was overshadowed in other contexts.

Finally, there was partial support for the hypothesis that the quality of children's relationships with their siblings, as measured by emotional supportiveness, positivity, warmth, negativity, or conflict would moderate the effect of peer experiences on children's loneliness and their internalizing and delinquent behavior problems. There was an overall effect of poor peer

experiences on loneliness such that lower levels of positive and higher levels of negative peer experiences were associated with higher levels of children's reports of loneliness. With respect to the prediction that the quality of sibling relationships would buffer the effect of problematic peer experiences on loneliness, only one of the four proposed relationship qualities was a significant moderator. Conflict within the sibling relationship significantly moderated the effect of positive peer experiences on loneliness. High levels of sibling conflict appeared to exacerbate the risk for loneliness among children with relatively few positive peer experiences.

Interestingly, however, sibling conflict did not appear to affect the association between negative peer experiences and loneliness, which is contrary to predictions. The difference in the effect that sibling conflict has on the relationship between different types of peer experiences and loneliness may reflect group differences among children struggling with low rates of positive or high rates of negative peer experiences. Research has consistently shown that children who are teased and picked on by their peers are at risk for developing loneliness (Asher & Wheeler, 1985; Hymel et al., 1990). However, research on children who are not supported or accepted by their peers is less consistent and suggests that they are not necessarily at an increased risk for loneliness (Asher & Wheeler, 1985). Perhaps the effects of low acceptance or liking from peers are not as detrimental to children unless they also experience teasing, hitting, and arguing at high levels from their brothers and sisters. Future research that examines the effect of sibling conflict should take into account group differences in peer experiences.

Moreover, the current findings highlight the notion that sibling conflict is complex and exerts both positive (Dunn et al., 1991; Howe, 1991; Lockwood et al., 2001) as well as negative (Brody, 1998; Stormshak, Bellanti, & Bierman, 1996) effects on peer experiences and psychological well-being. In particular, researchers propose that the severity, content, and parent

response to sibling conflict, as well as the degree to which other qualities, such as warmth, within the sibling relationship coexist must be further explored in order to understand the role of conflict (Brody, 1998; Stormshak, Bellanti, & Bierman, 1996). The current study did not assess the content, parent response, or the context of warmth/closeness in relation to conflict. As such, in the future, it will be important to examine how specific dimensions of conflict as well as the context of relationship warmth/closeness can impact children's social and psychological functioning.

It is important to note that the findings on loneliness have most consistently supported the current study's hypotheses. Overall, the findings are consistent with well-documented evidence that, among typically developing children, those who are rejected or not well-liked are at greater risk for loneliness (Parkhurst & Asher, 1992). These findings bolster research (i.e. Margalit, Tur-Kaspa, & Most, 1999) demonstrating that such an effect is also true for children with cognitive disabilities. The current study uniquely adds to the literature on loneliness through its measurement of peer experiences. Previous research typically employed peer nomination strategies to identify those children who were not accepted, rejected, or friendless (i.e. Asher et al., 1984, Asher et al., 1990; Dodge et al., 1982; Parkhurst & Asher, 1992). In contrast, the current study assessed children's peer experiences through self-, teacher, and parent reports. This study's concurrent findings on the association between adverse peer experiences and loneliness through the use of other informants suggest that, in addition to peers, children, teachers, and parents are attuned to the types of peer experiences that lead children to feel lonely.

In contrast to predictions, sibling emotional support, positivity, and negativity did not moderate the effect of either form of problematic peer experiences on loneliness. These findings, although contrary to this study's predictions, are consistent with one other study that examined

sibling relationships as sources of compensatory support among children with problematic peer relationships. Specifically, East and Rook (1992) found that, within a sample of typically developing children, those children who had problems with their peers tended to report higher levels of loneliness than did those children who were liked, regardless of perceived supportiveness, warmth, and affection within the sibling relationship. In light of the current findings and East and Rook's (1992) research, perhaps siblings are not sufficient in protecting children from loneliness when they are not liked, picked on, or friendless because of the amount of time these children are exposed to such harmful experiences. Specifically, because most children are in school and extracurricular activities each day, they likely spend a significant amount of time with peers and away from their siblings. It is reasonable to expect that those children who endure being ignored, hit, or teased for such extended amounts of time would likely feel lonelier regardless of their relationships with their brothers and sisters at home. Further, it is very likely that this phenomenon was detected within the current study because of how children's loneliness was assessed. Specifically, the *Loneliness Questionnaire* specifically assesses children's feelings of loneliness at school.

Regarding internalizing behavior problems, as predicted, there was a main effect of poor peer experiences on internalizing problems. Children with low levels of positive or high levels of negative peer experiences exhibited higher levels of internalizing behavior problems. As predicted, sibling relationship quality appeared to buffer this effect, which is consistent with predictions. Encouragingly, sibling emotional support protected against the effect of high rates of negative peer experiences on internalizing behavior problems. Among children who were rejected and picked on by their peers, those who received little emotional support from their brothers and sisters were at a greater risk for internalizing problems than those children who

received a high amount of emotional support. These findings are consistent with other research suggesting that children who are isolated from their peers were less at risk for anxiety if they had emotionally supportive siblings (East & Rook, 1992). In addition, negativity between siblings also moderated the effect of negative peer experiences on internalizing problems in children, which is consistent with hypotheses. At high levels of negativity within the sibling relationship, the association between high rates of negative peer experiences and high rates of internalizing was the strongest, whereas at low levels of negativity, the association was weakest. Thus, siblings who exhibited high rates of negativity towards their brothers and sisters appeared to amplify the detrimental effects of negative peer experiences on internalizing problems. These findings are consistent with the literature on sibling relationships and bullying in children. Specifically, Duncan (1999) and Wolke and Samara (2004) have found that, among typically developing children, those who were victims of bullying by their brothers and sisters (i.e. being hit, kicked, teased) as well as by their classmates were at significantly higher risk for problems with anxiety and depression than those children who experienced bullying only by their peers. It is understandable that children who are victims of such behavior at home and school would exhibit higher levels of worry, fearfulness, low mood, and hopelessness because they are the target of constant, and likely inescapable, threats towards their physical and emotional well-being.

Finally, it was hypothesized that the main effect of peer experiences on delinquency would be moderated by factors within the sibling relationship. Overall, there was a main effect of adverse peer experiences on delinquent behavior problems in children. As predicted, children who had low rates of positive or high rates of negative experiences with their peers exhibited significantly higher rates of delinquent behavior problems than children with more favorable

peer experiences. Moreover, there was a trend to suggest that sibling emotional support moderated the effect of negative peer experiences on delinquent behavior problems.

Specifically, among children with siblings who provided low levels of emotional support, there was a stronger association wherein more negative peer experiences predicted greater delinquent behaviors. This finding is consistent with the aforementioned findings that siblings can either cushion or exacerbate the harmful effects of negative peer experiences not only on problems with anxiety and depression, but on delinquent behavior problems as well. Such findings add to the literature illustrating that family members reinforce children's antisocial behavior through coercive interactions (i.e. Patterson, 1982). As such, it has been proposed that interventions should target family dynamics in order to prevent delinquent behavior in children (Patterson, DeBaryshe, & Ramsey, 1989). In particular, Patterson and his colleagues (1989) assert that parent-training in which parents are given specific instructions on behavioral management of their children is crucial in reducing children's disruptive and antisocial behavior. The current findings emphasize that a second line of intervention within the family may also be important. In particular, perhaps parents and siblings can be coached on how to identify and reduce negative interactions between brothers and sisters while promoting positive ones.

It is noteworthy that the findings in the current study suggest that emotional support and negativity between siblings is more important when children are teased and picked on than when they are not well liked or accepted at school. These findings are consistent with proposals (i.e. East & Rook, 1992) that the effect of siblings on the relationship between adverse peer experiences and psychological adjustment is complex and that future research examining sibling relationships among subgroups of children with differing peer experiences is necessary. It may be that children differ in their desire and motivation to seek out interpersonal relationships,

which, as a result, impacts their peer experiences and, ultimately the effectiveness of sibling relationships. Specifically, previous research has demonstrated that children who are classified as neglected make fewer attempts to interact with their peers than do children who are classified as rejected (Dodge et al., 1982). Perhaps such differences in peer social approach generalize to approach within sibling relationships. In particular, children who are hesitant to engage in social interactions with their peers may also be hesitant to seek out interactions or access support from their brothers and sisters. The children within the current study who exhibited low levels of positive peer experiences may not have sought out their brothers and sisters as much as those children who were actively rejected. Therefore, the benefits of sibling emotional support and the repercussions of sibling negativity were not as relevant for those children. In the future, research should address the differences in sibling relationships for children struggling with different types of adverse peer experiences.

In addition to the limitations noted above, other shortcomings of the current investigation should be considered in interpreting the findings. In contrast to previous research on children's experiences with their peers (i.e. French & Waas, 1985; Hymel et al., 1990; Ladd, 1983; Ladd & Burgess, 1999; Ladd, Kochenderfer, & Coleman, 1997; Rosenblum & Olson, 1997), this study did not employ peer nomination strategies, which are usually considered more valid forms of measurement of peer experiences as well as more valid forms of measurement as predictors of children's adjustment. Instead, the current study assessed the quality of children's experiences with their peers through self-, parent, and teacher reports. These measures may have been less sensitive than peer reports in assessing peer acceptance, liking, and rejection, and, therefore, make it more difficult to draw conclusions about the links between cognitive disabilities, sibling relationships, and psychological well-being. However, it is important to note that the inclusion

of data from multiple informants across contexts (i.e. home and school) within the current study yielded many findings consistent with research employing peer nomination scales. Moreover, the measures employed in the current study captured unique information regarding peer experiences that peer nominations do not. The measures in the current study assessed factors such as peer supportiveness, overt and relational aggression, and frequency and quality of friendships. Thus, making use of multiple forms of measurement that assess different aspects of peer experiences may provide a more comprehensive picture of the overall quality of peer experiences than peer nomination measures alone. Future research should examine differences between peer nomination and self-, teacher, and parent reports to understand better children's complex social worlds with their peers.

Another limitation of this study is that it did not consider how sibling relationship quality might vary based on cognitive disability and subsequently impact the association between peer experiences and psychological adjustment. Although there have been consistent findings demonstrating that there are high levels of warmth and intimacy within sibling dyads in which one child has mental retardation, the research among sibling dyads in which one child has a learning disability is limited. The potential for differences in sibling relationship quality has implications for the role of siblings as buffers in the face of harmful peer experiences. Sibling relationships may be more effective buffers for children with specific cognitive disabilities than for others.

Overall, the current study's findings are encouraging and provide support for the notion that brothers and sisters can help to buffer the effects of cognitive disability status on peer experiences and subsequent problems in psychological functioning. Most research on sibling dyads and cognitive disabilities focuses on the impact that the sibling with a cognitive disability

has on the typically developing sibling. The current study, however, is unique because it provides a more comprehensive picture of these sibling dyads and provides hope for those children with cognitive disabilities struggling with adverse peer experiences. In particular, this study provides evidence that siblings of children with a learning disability, like siblings of typically developing children, can promote positive peer experiences by introducing their brothers and sisters to appropriate social interactions. Moreover, this study expands upon previous research demonstrating that brothers and sisters serve as powerful buffers on psychological well-being in the face of adversity. These findings, however, were limited to specific instances. Brothers and sisters of children with and without cognitive disabilities did not safeguard against the association between low levels of positive peer experiences and internalizing or delinquent behavior problems among their siblings. Moreover, siblings did not protect their brothers and sisters who were rejected or teased from experiencing loneliness. Nevertheless, those siblings who were emotionally supportive protected against the effect of negative peer experiences on their brother's and sister's sadness, anxiety, and manifestation of delinquent behavior problems. Moreover, those siblings who engaged in high levels of conflict heightened loneliness for those children with few positive peer experiences and intensified delinquent behavior problems if they engaged in negativity with siblings struggling with negative peer experiences.

The evidence for the importance of siblings in the relationship between peer experiences and psychological well-being has implications for clinical interventions. In particular, both school and mental health professionals working with children who struggle with a cognitive disability and/or the stress of poor peer experiences should include brothers and sisters in their interventions. Because brothers and sisters spend a significant amount of time interacting with

each other, tend to imitate one another's behavior, and seek each other out during times of stress, they can serve as built in coaches and sources of support for one another. Interventions that teach typically developing siblings ways to model and practice appropriate social skills with their brothers and sisters can bolster specific social skills training at school or within therapy sessions. Moreover, interventions that are aimed at improving sibling supportiveness while decreasing negativity and unhealthy levels of conflict can also serve to protect at risk children from developing loneliness, anxiety, depression, or disruptive behavior problems.

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